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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT consult the notice entitled "update of information concerning the Patent Cooperation Treaty" appearing in the OFFICIAL GAZETTE of July 15, 1980.

Note that since August 1, 1979 certain fees for the processing of International Applications have been increased. The current schedule of fees is as follows:

Transmittal fee	$35.00
Search fee	300.00
Basic fee (first 30 pages)	190.00
Basic fee supplement (each sheet over 30)	3.50
Designation fee	45.00

June 17, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

Revised Patent Cooperation Treaty (PCT) Regulations

The fifth session of the Assembly of the International Patent Cooperation Treaty (PCT) Union was held in Geneva, Switzerland from June 9–16, 1980. At this meeting numerous changes in the PCT Rules were adopted to make the PCT route more attractive to prospective applicants.

The amendments to (including, where applicable, deletions affecting) PCT Rules 4.1(b)(ii), 4.8(b), 4.10(b), 4.11, 10.1(b), 10.1(c), 11.2(d), 11.12, 11.13(j), 13.2, 15.5, 17.1, 18.5, 19.2, 22.5, 30.1, 41, 46.2, 47.1(c), 54.4, 55.1, 57.4(b), 57.5(b), 60.1(b), 60.2(b), 80.6, 90.3(a), and 92.1(b) and to the Schedule of Fees and new Rules 11.10(d), 16*bis*, 20.3*bis*, 90.3(d), 91.2, 92.1(c), 92.4, and 92*bis*, become effective on October 1, 1980.

New Rule 13*bis* and the amendments to Rules 49.3 and 76.3 (the latter being consequential upon the amendment of Rule 49.3), become effective on January 1, 1981.

COMMENTS ON RULE CHANGES

Rule 4.1(b)(ii) and 4.11. A reference to an "other" search has been added in the Request to allow reference to a search which is neither an international nor an international-type search. This provision would call such a search to the attention of the International Searching Authority for possible refund of a portion of the search fee under PCT Rule 41. The standard practice of the United States Patent and Trademark Office (USPTO) to allow such reference and make such refunds will continue.

Rule 4.8(b). This Rule relates to the situation where there are plural applicants and no common agent or common representative has been appointed. The amended Rule states that the first named applicant who is entitled to file with the receiving Office in which the international application was filed will be considered to be the "common representative."

Rule 4.10(b). The last sentence has been amended to allow corrections to be made in the priority claim information where it is necessary due to an obvious error of transcription or due to the missing data which can be supplied on the basis of information the receiving Office has available to it.

Rule 10.1(b). The word "centigrade" has been replaced by the word "Celsius" to adopt current usage.

Rule 10.1(c). This paragraph was deleted since in effect it duplicated the requirements of Rule 10.1(a).

Rules 11.2(d) and 11.10(d). These Rules have been amended to provide for placing tables and chemical or mathematical formulae sideways on the sheets.

Rule 11.12. The phrase, "in exceptional cases," has been deleted. Accordingly, the Rule will now permit interlineations and other changes in the typed text as long as good reproduction is not in jeopardy.

Rule 11.13(j). The second sentence was added to indicate the arrangement of sideways positioned figures on drawing sheets.

Rule 13.2. This Rule, which relates to unity of invention, has been amended by adding a new section (iii) and by changing "one" to "an" or "a" in sections (i) and (ii). The USPTO will continue to apply the criteria set forth in M.P.E.P., sections 806.05(f) and 806.05(g). These criteria are considered to come within the wording "specially adapted" and "specifically designed," of Rule 13.2(iii).

Rule 13*bis*. This Rule was added to facilitate the filing of international applications relating to or involving the use of microorganisms which are not available to the public but have been deposited with a depositary institution. The Rule sets out the indications concerning such a deposit which must be included in an international application or furnished later (generally within 16 months after the priority date). Compliance with any national requirements diverging from this Rule will only be necessary if a designated State has notified the International Bureau of WIPO of the national requirement and the national requirement has been published in the PCT Gazette at least 2 months before the filing of the international application. Any notification received by the International Bureau of WIPO will be published in an issue of the PCT Gazette by the end of October 1980.

Where the Budapest Treaty on the International Recognition of the Deposit of Microorganisms for the Purposes of Patent Procedure does not govern the depositary institution with which a microrganism may be deposited for the purposes of any designated State, a deposit conforming with the law of the designated State will be required. The issue of the PCT Gazette referred to above will also contain notifications as to the depositary institutions with which deposits of microorganisms may be made for each such Office as well as those Offices whose national law does not make provision for such deposits.

Rule 15.5. The section on partial payment has been deleted in view of new Rule 16*bis*.

Rule 16*bis*. New Rule 16*bis* was added to provide greater security to the applicant and his professional representative in the case of a mistake (as to the prescribed amount) or delay (beyond the prescribed time limit) in the payment of fees to the receiving Office (transmittal fee, search fee, and international fee, i.e., basic fee and designation fees). The system introduced by this Rule guarantees the timely payment of these fees by the International Bureau of WIPO, thereby assuring that any mistake in the amount of the fee, or any delay in payment will not result in a loss of the application.

The new system operates in the following fashion. Where the receiving Office finds the amount paid to be insufficient to cover all fees due, the receiving Office will charge the International Bureau with the missing amount. The International Bureau will then notify the applicant of the amount it has advanced and will invite the applicant to pay the International Bureau the amount advanced, together with a 50% surcharge. The surcharge, however, cannot be less than 200 or more than 500 Swiss francs (see the Schedule of Fees.) If the applicant does not timely pay the required amount to the International Bureau, the latter will notify the receiving Office which will then declare the international application, or certain designations therein, withdrawn.

Rule 17.1. As amended, this Rule now provides that the priority document may be submitted to the receiving Office not only at the time of filing the international application but at any time thereafter, up to the expiration of 16 months from the priority date. The amended Rule also provides that where the priority document is issued by the receiving Office, the applicant may, up to the expiration of 16 months from the priority date, simply request the receiving Office to transmit the priority document to the International Bureau of WIPO. The date of the request to the receiving

Office or the date of receipt of the priority document by the receiving Office will be considered as the date of receipt of the priority document.

Rule 18.5. This paragraph was deleted in view of new Rule 92*bis* relating to changes in the person or name of the applicant.

Rule 19.2. This Rule has been rewritten to clearly indicate that if there are several applicants, an international application is properly filed as long as at least one of the applicants has the right to file in the receiving Office.

Rule 20.3*bis*. This is a new paragraph which simply refers to the Administrative Instructions (Section 309) for the manner of submitting corrections, where the original papers filed could not be granted a filing date.

Rule 22.5. Amended Rule 22.5 clarifies the handling of documents filed with the international application and which are referred to in the check list portion of the Request.

Rule 30.1. The time limit for determining that a filing date should not have been granted has been reduced from 6 months to 4 months from the international filing date.

Rule 41. This Rule now provides for the granting of a search fee refund on a search other than an international or international-type search.

Rule 46.2. Under the amended Rule, applicants will be notified of the date of receipt of any amendment under PCT Article 19 by the International Bureau.

Rule 47.1. Amended Rule 47.1(c) provides greater security to the applicant with regard to the communication of the international application to designated Offices under Article 20 of the PCT. Thus, the International Bureau of WIPO will, besides notifying the applicant of the communication, also notify each designated Office separately. This separate notification will be conclusive evidence that the international application was communicated to each designated Office, thereby avoiding the possibility that the applicant himself would be required to file another copy of the international application, in the event the communication by the International Bureau was defective.

It is noted, however, that until the patent law of Sweden is changed, this new system will not be permitted with respect to communications of international applications to the Swedish Patent Office.

Rule 49.3. This Rule has been amended to provide for translations of indications under Rule 13*bis* 4 which were not included in the original international application, and which refer to a deposited microorganism.

Rule 54.4, Rule 55.1, Rule 57.4(b), Rule 57.5(b), Rule 60.1(b), Rule 60.2(b), Rule 76.3 and Rule 80.6. These rules all relate to Chapter II procedure which is not available to international applications filed in the United States Receiving Office or designating the United States of America (35 U.S.C. 351(a)).

Rule 90.3(a). This Rule has been rewritten to clarify the fact that the appointment of an agent or common representative by the applicant can be made either on the request form or by a separate power of attorney.

Rule 90.3(d). This is a new Rule which provides for the use of general powers of attorney for the purpose of filing and processing international applications up to the point of entering the designated Offices. General powers of attorney will not be recognized by the United States Patent and Trademark Office for regularly filed national applications, or for international applications once they enter the national phase. A form for a general power of attorney appears in Annex M2 of the "PCT Applicant's Guide." Original copies of general powers of attorney must be filed with the PCT Division and a copy thereof filed in each international application relying thereon for the power of attorney.

Rule 91.2. This new Rule merely refers to the Administrative Instructions for the manner of making corrections of obvious errors of transcription.

Rule 92.1. Paragraph (b) has been substantially rewritten to require that the applicant be informed if a letter received from him was unsigned and that he be given time to correct such defect. If the defect is overlooked, new paragraph (c) indicates that the defect shall be disregarded.

Rule 92.4. This is a new paragraph which provides for timely receipt by International Authorities of responses filed by telegraph, teleprinter, etc., provided that the formal responses follow within 14 days.

Rule 92*bis*. This new Rule relates to changes in the person, name, residence, nationality, or address of the applicant and the person, name, or address of the inventor or agent.

Schedule of Fees. Item 5 has been added to set minimum and maximum amounts of surcharges for late payment under Rule 16*bis*.

Changes in Administrative Instructions effective October 1, 1980.

Section 106. The first paragraph has been designated "(a)" and a new paragraph (b) has been added to indicate that applicants who have not signed a general power of attorney for the purpose of appointing a common agent, may sign either the Request or a separate power of attorney.

Section 111. This is a new section requiring that any request for changes under Rule 92*bis*, be signed by the applicant or the receiving Office, depending upon who made the request.

Section 204. Paragraph "(v)" has been amended to provide for the indication of "Mode(s) for Carrying Out the Invention," in instances where the countries designated do not require an identification of the "best mode."

Section 205. Paragraph (a)(ii) has been amended to provide a procedure under Article 19 for adding a new claim with a number lower than the highest previously numbered claim.

Section 306. This Section has been deleted in view of new Section 111 and the cancellation of Rule 18.5.

Forms PCT/RO/101 and PCT/ISA/210 have only been changed in very minor aspects and are not included with this notice. The current forms may be used until the supply is exhausted. Future printings of these forms will incorporate the changes.

A copy of the amended PCT Rules and Administrative Instructions follows.

Aug. 25, 1980.

SIDNEY A. DIAMOND,
Commissioner of Patents and Trademarks.

RULE 4

The Request (Contents)

4.1 *Mandatory and Optional Contents; Signature*

(a) [No change]

(b) The request shall, where applicable, contain:

(i) a priority claim,

(ii) a reference to any earlier international, international-type or other search,

(iii) choices of certain kinds of protection,

(iv) an indication that the applicant wishes to obtain a regional patent and the names of the designated States for which he wishes to obtain such a patent,

(v) a reference to a parent application or parent patent.

(c) [No change]

(d) [No change]

4.2 [No change]

4.3 [No change]

4.4 [No change]

4.5 [No change]

4.6 [No change]

4.7 [No change]

4.8 *Representation of Several Applicants Not Having a Common Agent*

(a) [No change]

(b) If there is more than one applicant and the request does not refer to an agent representing all the applicants and it does not comply with the requirement of designating one of the applicants as provided in paragraph (a), the common representative shall be the applicant first named in the request who is entitled to file an international application with the receiving Office with which the international application was filed (Rule 19.1(a)).

4.9 [No change]

4.10 *Priority Claim*

(a) [No change]

(b) If the request does not indicate both

(i) when the earlier application is not a regional or an international application, the country in which it was filed; when the earlier application is a regional or an international application, at least one country for which it was filed, and

(ii) the date on which it was filed,

the priority claim shall, for the purposes of the procedure under the Treaty, be considered not to have been made except where, resulting from an obvious error of transcription, the indication of the said country or the said date is missing

or is erroneous; whenever the identity or correct identity of the said country, or the said date or the correct date, may be established on the basis of the copy of the earlier application which the receiving Office receives before it transmits the record copy to the International Bureau, the error shall be considered as an obvious error.

(c) [No change]
(d) [No change]
(e) [No change]

4.11 *Reference to Earlier Search*

If an international or international-type search has been requested on an application under Article 15(5) or if the applicant wishes the International Searching Authority to base the international search report wholly or in part on the results of a search, other than an international or international-type search, made by the national Office or intergovernmental organization which is the International Searching Authority competent for the international application, the request shall contain a reference to that fact. Such reference shall either identify the application (or its translation, as the case may be) in respect of which the earlier search was made by indicating country, date and number, or the said search by indicating, where applicable, date and number of the request for such search.

4.12 [No change]
4.13 [No change]
4.14 [No change]
4.15 [No change]
4.16 [No change]
4.17 [No change]

RULE 10

Terminology and Signs

10.1 *Terminology and Signs*

(a) [No change]

(b) Temperatures shall be expressed in degrees Celsius, or also expressed in degrees Celsius, if first expressed in a different manner.

(c) [Deleted]
(d) [No change]
(e) [No change]
(f) [No change]

10.2 [No change]

RULE 11

Physical Requirements of the International Application

11.1 [No change]

11.2 *Fitness for Reproduction*

(a) [No change]
(b) [No change]
(c) [No change]

(d) Subject to Rule 11.10(d) and Rule 11.13(j), each sheet shall be used in an upright position (i.e., the short sides at the top and bottom).

11.3 [No change]
11.4 [No change]
11.5 [No change]
11.6 [No change]
11.7 [No change]
11.8 [No change]
11.9 [No change]

11.10 *Drawings, Formulae, and Tables, in Text Matter*

(a) [No change]
(b) [No change]
(c) [No change]

(d) Tables and chemical or mathematical formulae may be placed sideways on the sheet, if they cannot be presented satisfactorily in an upright position thereon: sheets on which tables or chemical or mathematical formulae are presented sideways shall be so presented that the tops of the tables or formulae are at the left side of the sheet.

11.11 [No change]

11.12 *Alterations, Etc.*

Each sheet shall be reasonably free from erasures and shall be free from alterations, overwritings, and interlineations. Non-compliance with this Rule may be authorized if the authenticity of the content is not in question and the requirements for good reproduction are not in jeopardy.

(a) [No change]
(b) [No change]
(c) [No change]
(d) [No change]
(e) [No change]
(f) [No change]
(g) [No change]
(h) [No change]
(i) [No change]

(j) The different figures shall be arranged on a sheet or sheets without wasting space, preferably in an upright position, clearly separated from one another. Where the figures are not arranged in an upright position, they shall be presented sideways with the top of the figures at the left side of the sheet.

(k) [No change]
(l) [No change]
(m) [No change]
(n) [No change]

11.14 [No change]
11.15 [No change]

RULE 13

Unity of Invention

13.1 [No change]

13.2 *Claims of Different Categories*

Rule 13.1 shall be construed as permitting, in particular, one of the following three possibilities:

(i) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the said product, and the inclusion in the same international application of an independent claim for a use of the said product, or

(ii) in addition to an independent claim for a given process, the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the said process, or

(iii) in addition to an independent claim for a given product, the inclusion in the same international application of an independent claim for a process specially adapted for the manufacture of the product, and the inclusion in the same international application of an independent claim for an apparatus or means specifically designed for carrying out the process.

13.3 [No change]
13.4 [No change]
13.5 [No change]

RULE 13*bis*

Microbiological Inventions

13*bis*.1 *Definition*

For the purposes of this Rule, "reference to a deposited microorganism" means particulars given in an international application with respect to the deposit of a microorganism with a depositary institution or to the microorganism so deposited.

13*bis*.2 *References (General)*

Any reference to a deposited microorganism shall be made in accordance with this Rule and, if so made, shall be considered as satisfying the requirements of the national law of each designated State.

13*bis*.3 *References: Contents; Failure to Include Reference or Indication*

(a) A reference to a deposited microorganism shall indicate,

(i) the name and address of the depositary institution with which the deposit was made;

(ii) the date of deposit of the microorganism with that institution;

(iii) the accession number given to the deposit by that institution; and

(iv) any additional matter of which the International Bureau has been notified pursuant to Rule 13*bis*.7(a)(1), provided that the requirement to indicate that matter was published in the Gazette in accordance with the Rule 13*bis*.7(c) at least two months before the filing of the international application.

(b) Failure to include a reference to a deposited microorganism or failure to include, in a reference to a deposited microorganism, an indication in accordance with paragraph (a), shall have no consequence in any designated State

whose national law does not require such reference or such indication in a national application.

13*bis*.4 *References: Time of Furnishing Indications*

If any of the indications referred to in Rule 13*bis*.3(a) is not included in a reference to a deposited microorganism in the international application as filed but is furnished by the applicant to the International Bureau within 16 months after the priority date, the indication shall be considered by any designated Office to have been furnished in time unless its national law requires the indication to be furnished at an earlier time in the case of a national application and the International Bureau has been notified of such requirement pursuant to Rule 13*bis*.7(a)(ii), provided that the International Bureau has published such requirement in the Gazette in accordance with Rule 13*bis*.7(c) at least two months before the filing of the international application. In the event that the applicant makes a request for early publication under Article 21(2)(b), however, any designated Office may consider any indication not furnished by the time such request is made as not having been furnished in time. Irrespective of whether the applicable time limit under the preceding sentences has been observed, the International Bureau shall notify the applicant and the designated Offices of the date on which it has received any indication not included in the international application as filed. The Internationel Bureau shall indicate that date in the international publication of the international application if the indication has been furnished to it before the completion of technical preparations for international publication.

13*bis*.5 *References and Indications for the Purposes of One or More Designated States; Different Deposits for Different Designated States; Deposits with Depositary Institutions other than Those Notified*

(a) A reference to a deposited microorganism shall be considered to be made for the purposes of all designated States, unless it is expressly made for the purposes of certain of the designated States only; the same applies to the indications included in the reference.

(b) References to different deposits of the microorganism may be made for different designated States.

(c) Any designated Office shall be entitled to disregard a deposit made with a depositary institution other than one notified by it under Rule 13*bis*.7(b).

13*bis*.6 *Furnishing of Samples*

(a) Where the international application contains a reference to a deposited microorganism, the applicant shall, upon the request of the International Searching Authority or the International Preliminary Examining Authority, authorize and assure the furnishing of a sample of that microorganism by the depositary institution to the said Authority, provided that the said Authority has notified the International Bureau that it may require the furnishing of samples and that such samples will be used solely for the purposes of international search for international preliminary examination, as the case may be, and such notification has been published in the Gazette.

(b) Pursuant to Articles 23 and 40, no furnishing of samples of the deposited microorganism to which a reference is made in an international application shall, except with the authorisation of the applicant, take place before the expiration of the applicable time limits after which national processing may start under the said Articles. However, where the applicant performs the acts referred to in Articles 22 or 39 after international publication but before the expiration of the said time limits, the furnishing of samples of the deposited microorganism may take place, once the said acts have been performed. Notwithstanding the previous provision, the furnishing of samples from the deposited microorganism may take place under the national law applicable for any designated Office as soon as, under that law, the international publication has the effects of the compulsory national publication of an unexamined national application.

13*bis*.7 *National Requirements: Notification and Publication*

(a) Any national Office may notify the International Bureau of any requirement of the national law,

(i) that any matter specified in the notification, in addition to those referred to in Rule 13*bis*.3(a)(i), (ii) and (iii), is required to be included in a reference to a deposited microorganism in a national application;

(ii) that one or more of the indications referred to in Rule 13*bis*.3(a) are required to be included in a national application as filed or are required to be furnished at a time specified in the notification which is earlier than 16 months after the priority date.

(b) Each national Office shall notify the International Bureau a first time before entry into force of this Rule and then each time a change occurs of the depositary institutions with which the national law permits deposits of microorganisms to be made for the purposes of patent procedure before that Office or, if the national law does not provide for or permit such deposits, of that fact.

(c) The International Bureau shall promptly publish in the Gazette requirements notified to it under paragraph (a) and information notified to it under paragraph (b).

RULE 15

The International Fee

15.1 [No change]
15.2 [No change]
15.3 [No change]
15.4 [No change]
15.5 [Deleted]
15.6 [No change]

RULE 16*bis*

Advancing Fees by the International Bureau

16*bis*.1 *Guarantee by the International Bureau*

(a) Where, by the time they are due under Rule 14.1(b), Rule 15.4(a) or (c) and Rule 16.1(f), the receiving Office finds that in respect of an international application no fees were paid to it by the applicant, or that the amount paid to it by the applicant is less than what is necessary to cover the transmittal fee, the basic fee and the search fee, the receiving Office shall charge the amount required to cover those fees, or the missing part thereof, to the International Bureau and shall consider the said amount as if it had been paid by the applicant at the due time.

(b) Where, by the time it or they are under Rule 15.4(b) or (c), the receiving Office finds that in respect of an international application the payment made by the applicant is insufficient to cover the designation fees necessary to cover all the designations, the receiving Office shall charge the amount required to cover those fees to the International Bureau and shall consider that amount as if it had been paid by the applicant at the due time.

(c) The International Bureau shall transfer from time to time to each receiving Office an amount which is expected to be necessary for covering any charges that the receiving Office has to make under paragraphs (a) and (b). The amount and the time of such transfers shall be determined by each receiving Office according to its own wish. The charging of any amount under paragraphs (a) and (b) shall not require any advance notice to, or any agreement by, the International Bureau.

(d) Each month, the receiving Office shall inform the International Bureau of the charges, if any, made under paragraphs (a) and (b).

16*bis*.2 *Obligations of the Applicant*

(a) The International Bureau shall promptly notify the applicant of any amount by which it was charged under Rule 16*bis*.1(a) and (b) and shall invite him to pay it, within one month from the date of the notification, the said amount augmented by a surcharge of 50%, provided that the surcharge will not be less, and will not be more, than the amounts indicated in the Schedule of Fees. The notification may refer to the charges made both under Rule 16*bis*.1(a) and (b) or, at the discretion of the International Bureau, there may be two separate notifications, one referring to charges made under Rule 16*bis*.1(a), the other referring to charges made under Rule 16*bis*.1(b).

(b) If the applicant fails to pay, within the said time limit, to the International Bureau the amount claimed, or pays less than what is needed to cover the transmittal fee, the basic fee, the search fee, one designation fee and the surcharge, the International Bureau shall notify the receiving Office accordingly and the receiving Office shall declare the international application withdrawn under Article 14(3)(a) and the receiving Office and the International Bureau shall proceed as provided in Rule 29.

(c) If the applicant pays, within the said time limit, to the International Bureau an amount which is more than what is needed to cover the fees and surcharge referred to in paragraph (b) but less than what is needed to cover all the designations maintained, the International Bureau shall notify the receiving Office accordingly and the receiving Office shall apply the amount paid in excess of what is needed to cover the fees and surcharge referred to in paragraph (b) in an order which shall be established as follows:

(i) where the applicant indicates to which designation or designations the amount is to be applied, it shall be applied accordingly but, if the amount received is insufficient to cover the designations indicated, it shall be applied to as many designations as are covered by it in the order chosen by the applicant in indicating the designations;

(ii) to the extent that the applicant has not given the indications under item (i), the amount or the balance thereof shall be applied to the designations in the order in which they appear in the international application;

(iii) where the designation of a State is for the purposes of a regional patent and provided that the required designation fee is, under the preceding provisions, available for that designation, the designation of any further States for which the same regional patent is sought shall be considered as covered by that fee.

The receiving Office shall declare any designation not covered by the amount paid withdrawn under Article 14(3)(b) and the receiving Office and the International Bureau shall proceed as provided in Rule 29.

(d) The receiving Office shall not return to the International Bureau any amount that it has charged to that Bureau for covering the transmittal fee.

(e) Where the international application is considered withdrawn, any amount charged to the International Bureau, other than the amount needed to cover the transmittal fee and the search fee transferred by the receiving Office to the International Searching Authority, shall be returned by the receiving Office to the International Bureau.

(f) Where the international application is considered withdrawn, any search fee charged by the receiving Office and transferred to the International Searching Authority shall be transferred by that Authority to the International Bureau unless the said Authority has already started the international search.

(g) Where paragraph (c) applies, the amount charged by the receiving Office to the International Bureau for designations which, as a consequence of the application of the order under that paragraph, are not maintained, shall be returned to the International Bureau by the receiving Office.

16*bis*.3 *Notifications*

(a) Any receiving Office may exclude the application of Rules 16*bis*.1 and 16*bis*.2 by a written notification to that effect given to the International Bureau by September 1, 1980. Such notification may be withdrawn at any time. The International Bureau shall publish all such notifications and withdrawals in the Gazette.

(b) Former Rule 15.5* remains applicable in respect of any receiving Office giving a notification under paragraph (a).

* Former Rule 15.5 *Partial Payment*

(a) Where the amount of the international fee received by the receiving Office is not less than that of the basic fee and at least one designation fee but less than the amount required to cover the basic fee and all the designations made in the international application, the amount received shall be applied as follows:

(i) to cover the basic fee, and

(ii) to cover as many designation fees as, after deduction of the basic fee may be covered in full by the amount received in the order indicated in paragraph (b).

(b) The order in which the said amount shall be applied to the designations shall be established as follows:

(i) where the applicant indicates to which designation or designations the amount is to be applied, it shall be applied accordingly but, if the amount received is insufficient to cover the designations indicated, it shall be applied to as many designations as are covered by it in the order chosen by the applicant in indicating the designations;

(ii) to the extent that the applicant has not given the indications under item (i), the amount or the balance thereof shall be applied to the designations in the order in which they appear in the international application;

(iii) where the designation of a State is for the purposes of a regional patent and provided that the required designation fee is, under the preceding provisions, available for that designation, the designation of any further States for which the same regional patent is sought shall be considered as covered by that fee.

RULE 17

The Priority Document

17.1 *Obligation to Submit Copy of Earlier National Application*

(a) Where the priority of an earlier national application is claimed under Article 8 in the international application, a copy of the said national application, certified by the authority with which it was filed ("the priority document"), shall, unless already filed with the receiving Office together with the international application, be submitted by the applicant to the International Bureau or to the receiving Office not later than 16 months after the priority date or, in the case referred to in Article 23(2), not later than at the time the processing or examination is requested. Where submitted to the receiving Office, the priority document shall be transmitted by that Office to the International Bureau together with the record copy or promptly after having been received by that Office. In the latter case, the receiving Office shall indicate to the International Bureau the date on which it received the priority document.

(b) Where the priority document is issued by the receiving Office, the applicant may, instead of submitting the priority document, request the receiving Office to transmit the priority document to the International Bureau. Such request shall be made not later than the expiration of the applicable time limit referred to under paragraph (a) and may be subjected by the receiving Office to the payment of a fee. The receiving Office shall, promptly after receipt of such request, and, where applicable, the payment of such fee, transmit the priority document to the International Bureau with an indication of the date of receipt of such request.

(c) If the requirements of neither of the two preceding paragraphs are complied with, any designated State may disregard the priority claim.

(d) The International Bureau shall record the date on which the priority document has been received by it or by the receiving Office. Where applicable the date of receipt by the receiving Office of a request referred to under paragraph (b) shall be recorded as the date of receipt of the priority document. The International Bureau shall notify the applicant and the designated Offices accordingly.

17.2 [No change]

RULE 18

The Applicant

18.1 [No change]
18.2 [No change]
18.3 [No change]
18.4 [No change]
18.5 [Deleted]

RULE 19

The Competent Receiving Office

19.1 [No change]

19.2 *Several Applicants*

If there are several applicants, the requirements of Rule 19.1 shall be considered to be met if the national Office with which the international application is filed is the national Office of or acting for a Contracting State of which at least one of the applicants is a resident or national.

19.3 [No change]

RULE 20

Receipt of the International Application

20.1 [No change]
20.2 [No change]
20.3 [No change]

20.3*bis* *Manner of Carrying Out Corrections*

The Administrative Instructions prescribe the manner in which corrections required under Article 11(2)(a) shall be presented by the applicant and the manner in which they shall be entered in the file of the international application.

20.4 [No change]

20.5 [No change]
20.6 [No change]
20.7 [No change]
20.8 [No change]
20.9 [No change]

RULE 22

Transmittal of the Record Copy

22.1 [No change]
22.2 [No change]
22.3 [No change]
22.4 [No change]

22.5 *Documents Filed with the International Application*

Any power of attorney and any priority document filed with the international application referred to in Rule 3.3(a)(ii) shall accompany the record copy; any other document referred to in that Rule shall be sent only at the specific request of the International Bureau. If any document referred to in Rule 3.3(a)(ii) which is indicated in the check list as accompanying the international application is not, in fact, filed at the latest by the time the record copy leaves the receiving Office, that Office shall so note on the check list and the said indication shall be considered as if it had not been made.

RULE 30

Time Limit Under Article 14(4)

30.1 *Time Limit*

The time limit referred to in Article 14(4) shall be 4 months from the international filing date.

RULE 41

Earlier Search other than International Search

11.1 *Obligation to Use Results: Refund of Fee*

If reference has been made in the request, in the form provided for in Rule 4.11, to an international-type search carried out under the conditions set out in Article 15(5) or to a search other than an international or international-type search, the International Searching Authority shall, to the extent possible, use the results of the said search in establishing the international search report on the international application. The International Searching Authority shall refund the search fee, to the extent and under the conditions provided for in the agreement under Article 16(3)(b) or in a communication addressed to and published in the Gazette by the International Bureau, if the international search report could wholly or partly be based on the results of the said search.

RULE 46

Amendment of Claims Before the International Bureau

46.1 [No change]

46.2 *Dating of Amendments*

The date of filing of any amendment shall be recorded by the International Bureau, which shall also notify the applicant of the date and indicate the date in any publication or copy issued by it.

46.3 [No change]
46.4 [No change]

RULE 47

Communication to Designated Offices

47.1 *Procedure*

(a) [No change]
(b) [No change]
(c) The International Bureau shall send a notice to the applicant indicating the designated Offices to which the communication has been effected and the date of such communication. Such notice shall be sent on the same day as the communication. Each designated Office shall be informed, separately from the communication, about the sending and the date of mailing of the notice. The notice shall be accepted by all designated Offices as conclusive evidence that the communication has duly taken place on the date specified in the notice.
(d) [No change]
(e) [No change]

47.2 [No change]
47.3 [No change]

RULE 49

Languages of Translations and Amounts of Fees under Article 22(1) and (2)

49.1 [No change]
49.2 [No change]

49.3 *Statements under Article 19; Indications under Rule 13bis.4*

For the purposes of Article 22 and the present Rule, any statement made under Article 19(1) and any indication furnished under Rule 13*bis*.4 shall be considered part of the international application.

The Applicant Entitled to Make a Demand

54.1 [No change]
54.2 [No change]
54.3 [No change]
54.4 [Deleted]

RULE 55

Languages (International Preliminary Examination)

55.1 *The Demand*

The demand shall be in the language of the international application or, when a translation is required under Rule 55.2, in the language of that translation, provided that the International Preliminary Examining Authority may permit the demand to be in any language specified in the agreement concluded between the International Bureau and that Authority.

55.2 [No change]

RULE 57

The Handling Fee

57.1 [No change]
57.2 [No change]
57.3 [No change]

57.4 *Failure to Pay (Handling Fee)*

(a) [No change]
(b) If the applicant complies with the invitation within the one-month time limit, the handling fee shall be considered as if it had been paid on the due date.
(c) [No change]

57.5 *Failure to Pay (Supplement to the Handling Fee)*

(a) [No change]
(b) If the applicant complies with the invitation within the one-month time limit, the supplement to the handling fee shall be considered as if it had been paid on the due date.
(c) [No change]

57.6 [No change]

RULE 60

Certain Defects in the Demand or Elections

60.1 *Defects in the Demand*

(a) [No change]
(b) If the applicant complies with the invitation within the prescribed time limit, the demand shall be considered as if it had been received on the actual filing date, provided that the demand as submitted contained at least one election and permitted the international application to be identified; otherwise, the demand shall be considered as if it had been received on the date on which the International Preliminary Examining Authority receives the correction.
(c) [No change]
(d) [No change]

60.2 *Defects in Later Elections*

(a) [No change]
(b) If the applicant complies with the invitation within the prescribed time limit, the later election shall be considered as if it had been received on the actual filing date, provided that the later election as submitted contained at least one election and permitted the international application to be identified; otherwise, the later election shall be considered as if it had been received on the date on which the International Bureau receives the correction.
(c) [No change]

60.3 [No change]

RULE 76

Languages of Translations and Amounts of Fees under Article 39(1); Translation of Priority Document

76.1 [No change]

76.2 [No change]

76.3 *Statements under Article 19; Indications under Rule 13bis.4*

For the purposes of Article 39 and the present Rule, any statement made under Article 19(1) and any indication furnished under Rule 13*bis*.4 shall be considered part of the international application.

76.4 [No change]

RULE 80

Computation of Time Limits

80.1 [No change]

80.2 [No change]

80.3 [No change]

80.4 [No change]

80.5 [No change]

80.6 *Date of Documents*

(a) Where a period starts on the day of the date of a document or letter emanating from a national Office or intergovernmental organization, any interested party may prove that the said document or letter was mailed on a day later than the date it bears, in which case the date of actual mailing shall, for the purposes of computing the period, be considered to be the date on which the period starts. Irrespective of the date on which such a document or letter was mailed, if the applicant offers to the national Office or intergovernmental organization evidence which satisfies the national Office or intergovernmental organization that the document or letter was received more than 7 days after the date it bears, the national Office or intergovernmental organization shall treat the period starting from the date of the document or letter as expiring later by an additional number of days which is equal to the number of days which the document or letter was received later than 7 days after the date it bears.

(b) Any receiving Office may exclude the application of paragraph (a) by a written notification to that effect given to the International Bureau by September 1, 1980. Such notification may be withdrawn at any time. The International Bureau shall publish all such notifications and withdrawals in the Gazette.

80.7 [No change]

RULE 90

Representation

90.1 [No change]

90.2 [No change]

90.3 *Appointment*

(a) Appointment of any agent, or of any common representative within the meaning of Rule 4.8(a), shall be effected by each applicant, at his choice, either by signing the request in which the agent or common representative is designated or by a separate power of attorney (i.e., a document appointing an agent or common representative).

(b) [No change]

(c) [No change]

(d) A general power of attorney may be deposited with the receiving Office for purposes of the processing of the international application as defined in Rule 90.2(d). Reference may be made in the request to such general power of attorney, provided that a copy thereof is attached to the request by the applicant.

90.4 [No change]

RULE 91

Obvious Errors of Transcription

91.1 [No change]

91.2 *Manner of Carrying Out Rectifications*

The Administrative Instructions prescribe the manner in which rectifications of obvious errors of transcription shall be made and the manner in which they shall be entered in the file of the international application.

RULE 92

Correspondence

92.1 *Need for Letter and for Signature*

(a) [No change]

(b) If the requirements provided for in paragraph (a) are not complied with, the applicant shall be informed as to the non-compliance and invited to remedy the omission within a time limit fixed in the invitation. The time limit so fixed shall be reasonable in the circumstances; even where the time limit so fixed expires later than the time limit applying to the furnishing of the paper (or even if the latter time limit has already expired), it shall not be less than 10 days and not more than one month from the mailing of the invitation. If the omission is remedied within the time limit fixed in the invitation, the omission shall be disregarded; otherwise, the applicant shall be informed that the paper has been disregarded.

(c) Where non-compliance with the requirements provided for in paragraph (a) has been overlooked and the paper taken into account in the international procedure, the non-compliance shall be disregarded.

92.2 [No change]

92.3 [No change]

92.4 *Use of Telegraph, Teleprinter, etc.*

(a) Notwithstanding the provisions of Rules 11.14 and 92.1(a), but subject to paragraph (b), below, any document (including any drawing) subsequent to the international application may be sent by telegraph or teleprinter or other like means of communication producing a printed or written document. Any such document so sent shall be considered to have been submitted in a form complying with the requirements of the said Rules on the day on which it was communicated by the means mentioned above, provided that, within 14 days after being so communicated, its contents are furnished in that form; otherwise, the telegraphic, teleprinter or other communication shall be considered not to have been made.

(b) Each national Office or intergovernmental organization shall promptly notify the International Bureau of any means referred to in paragraph (a) by which it is prepared to receive documents referred to in that paragraph. The International Bureau shall publish the information so received in the Gazette as well as information concerning the means referred to in paragraph (a) by which the International Bureau is prepared to receive any such document. Paragraph (a) shall apply with respect to any national Office or intergovernmental organization only to the extent the said information has been so published with respect to it. The International Bureau shall publish, from time to time, in the Gazette, changes in the information previously published.

RULE 92*bis*

Changes in Certain Indications in the Request or the Demand

92*bis*.1 *Recording of Changes by the International Bureau*

The International Bureau shall, on the request of the applicant or the receiving Office, record changes in the following indications appearing in the request or demand:

(i) person, name, residence, nationality or address of the applicant,

(ii) person, name or address of the agent, the common representative or the inventor.

92*bis*.2 *Notifications*

(a) The International Bureau shall give notifications concerning changes recorded by it:

(i) to the receiving Office where the change has been recorded on the request of the applicant,

(ii) as long as the international search report or the declaration referred to in Article 17(2) has not yet issued, to the International Searching Authority,

(iii) until the expiration of the time limit referred to in Article 22(1), to the designated Offices,

(iv) as long as the international preliminary examination report has not yet issued, to the International Preliminary Examining Authority,

(v) until the expiration of the time limit referred to in Article 39(1)(a), to the elected Offices.

(b) A copy of each notification sent under paragraph (a) shall be sent to the applicant by the International Bureau.

SCHEDULE OF FEES

Fees	*Amounts*
1. Basic Fee: (Rule 15.2(a)) if the international application contains not more than 30 sheets	325 Swiss francs
if the international application contains more than 30 sheets	325 Swiss francs plus 6 Swiss francs for each sheet in excess of 30 sheets
2. Designation Fee: (Rule 15.2(a))	78 Swiss francs
3. Handling Fee: (Rule 57.2(a))	100 Swiss francs
4. Supplement to the Handling Fee: (Rule 57.2(b))	100 Swiss francs
Surcharges	
5. Surcharge for late payment: (Rule 16*bis*.2(a))	Minimum: 200 Swiss francs Maximum: 500 Swiss francs

* * * * *

Changes in the Administrative Instructions.

SECTION 106

Common Agent for Several Applicants

(a) [Existing text of Section 106]

(b) Where the international application is filed with reference to a general power of attorney not signed by all the applicants, it shall be sufficient for the purpose of appointment of a common agent under Rule 90.3, if the request or a separate power of attorney is signed by the applicant, who did not sign the general power of attorney.

SECTION 111

Changes in Certain Indications in the Request and the Demand

Any request for the recording of any changes referred to under Rule 92*bis* shall be signed by the applicant or, if the receiving Office requested such change, by the receiving Office. The request shall clearly identify the indications the change of which is requested.

SECTION 204

Headings of the Parts of the Description

The headings referred to in Rule 5.1(c) should be as follows:

(i) for matter referred to in Rule 5.1(a)(i), "Technical Field;"

(ii) for matter referred to in Rule 5.1(a)(ii), "Background Art;"

(iii) for matter referred to in Rule 5.1(a)(iii), "Disclosure of Invention;"

(iv) for matter referred to in Rule 5.1(a)(iv), "Brief Description of Drawings;"

(v) for matter referred to in Rule 5.1(a)(v), "Best Mode for Carrying Out the Invention," or, where appropriate, "Mode(s) for Carrying Out the Invention;"

(vi) for matter referred to in Rule 5.1(a)(vi), "Industrial Applicability."

SECTION 205

Numbering of Claims Upon Amendment

(a) Any claim submitted after the filing date of the international application and which is not identical with the claims previously appearing in the international application shall, at the choice of the applicant, be submitted either:

(i) as an amended claim, in which case, it shall bear the same number as the previous claim it amends; that number shall be followed by the word "(amended)" or its equivalent in the language of the international application; or

(ii) as a new claim, in which case it shall bear the next number after the highest previously numbered claim; that number shall be followed by the word "(new)" or its equivalent in the language of the international application; where the consecutive order of claims requires that a new claim be given a number lower than the highest previously numbered claim, the claims following the new claim shall be renumbered; any new number shall be followed by the words "(Original claim No.)" or an equivalent of these words in the language of the international application and an indication of the original number of the renumbered claim.

(b) [No change]

SECTION 306

[Deleted]

ANNEX F TO THE ADMINISTRATIVE INSTRUCTIONS FORMS

Form PCT/RO/101 (Request and Fee Calculation Sheet): page 3 of this form, Was modified.

Form PCT/ISA/210 (International Search Report): an additional (optional) sheet for this form called "(Extra Sheet)" is provided.

Patent Suits

Notices under 35 USC 290; Patent Act of 1952

3,211,615, William M. McLamore, ORAL ANTIDIABETIC COMPOSITION AND METHOD OF USE; **3,349,124,** same, ANTIDIABETIC AGENT, **filed** July 16, 1980, D.C.N.J. (Newark), Doc. 80–2196, *Pfizer Pharmaceutical, Inc.* v. *Premo Pharmaceutical Laboratories.*

3,288,248, Gurian and Bernstein, POOL LADDER, **filed** July 14, 1980, D.C. Mass. (Boston), Doc. 80–1547–N, *Coleco Industries, Inc. et al.* v. *Hub Manufacturing Company, Inc.*

3,340,821, Erich Wesener, TRANSPORTATION SYSTEM, **filed** July 23, 1979, D.C., N.D. Ill. (Chicago), Doc. 79c3038, *Siemens Aktiengesellschaft* v. *Burno Patent et al.* Motion to dismiss without prejudice and without costs to parties filed on June 30, 1980.

3,345,458, RCA Corporation, DIGITAL STORAGE AND GENERATION OF VIDEO SIGNALS, **filed** July 16, 1980, D.C. Del. (Wilmington), Doc. 80–337, *RCA Corporation* v. *Lear Siegler, Inc.*

3,349,124. (See 3,211,615.)

3,383,487, Chomerics, Inc., THIN FLEXIBLE MAGNETIC SWITCH; **4,066,851,** same, KEYBOARD SWITCH ASSEMBLY HAVING FOLDABLE PRINTED CIRCUIT BOARD, INTEGRAL SPACER AND PREFORMED DEPRESSION-TYPE ALIGNMENT FOLD, **filed** Apr. 28, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c2073, *Chomerics, Inc.* v. *Oak Industries, Inc.*

3,424,189, Woodford Manufacturing Company, SELF-DRAINING SILL COCK AND VACUUM BREAKER; **D. 227,365,** same, WALL HYDRANT, **filed** Nov. 1, 1977, D.C., N.D. Ind. (South Bend), Doc. S77–0192, *Woodford Manufacturing Company* v. *Josam Manufacturing Co.* Judgment entered in favor of Josam Manufacturing Co. Patent No. 3,424,189 is invalid and not infringed. Filed June 19, 1980. **Same, filed** Jan. 19, 1978, D.C., N.D. Ind. (South Bend), Doc. S78–21, *Josam Manufacturing Co.* v. *Woodford Manufacturing Co.* Judgment entered in favor of Josam Manufacturing Co. Patent No. 3,424,189 is invalid and not infringed. Filed June 19, 1980.

3,428,558, John P. Murphy, METHOD OF CLARIFYING WATER AND COMPOSITIONS USED THEREFOR, **filed** June 27, 1980, D.C., N.D. Ohio (Akron), Doc. C–80–1106, *John P. Murphy* v. *Chemed Corporation.*

3,463,340, Tropicana Products, Inc., SCREW CAP WITH LOCKING MEANS, **filed** July 26, 1978, D.C., M.D. Fla. (Tampa), Doc. 78–596–C–T.H., *Tropicana Products, Inc.* v. *Suncoast Plastic Closures, Inc.* Order of dismissal granted on June 18, 1980.

3,464,129, Compro-Frink Corporation, BLADE AND MOLDBOARD SUPPORTING AND ADJUSTING STRUCTURE FOR SNOWPLOWS; **3,604,131,** same, MOLDBOARD SUPPORTING STRUCTURE, **filed** July 14, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80–2748, *Compro-Frink Corporation* v. *Valk Manufacturing Company.*

3,604,131. (See 3,464,129.)

3,739,076, Larry Schwartz, ELECTRICAL CABLE TERMINATING AND GROUNDING CONNECTOR, **filed** July 1, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–02856, *Larry Schwartz* v. *Kern Engineering and Manufacturing Corp. et al.*

3,792,133, A. C. Aukerman Company, METHOD FOR SLIP-FORMING WALLS OF ASYMMETRICAL TRANSVERSE CROSS SECTION; **4,014,633,** same, ADJUSTABLE SLIP FORM, **filed** July 30, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c4005, *A. C. Aukerman Company* v. *Miller Formless Company, Inc.*

3,825,162, Precision Handling Devices, Inc., FEED MECHANISM; **4,129,239,** same, CLAMPING DEVICES FOR DOCUMENT TRACTORS, **filed** July 29, 1980, D.C. Conn. (Hartford), Doc. H–80–468, *Precision Handling Devices Inc.* v. *Data Motion Inc.*

3,826,068, Weed Eater, Inc., ROTARY CUTTING ASSEMBLY; **3,850,776,** same, **filed** July 9, 1976, D.C., S.D. Tex. (Houston), Doc. 76–H–1159, *Weed Eater, Inc.* v. *K & S Mfg. Co., et al.* Case dismissed with prejudice on motion for summary judgment by defendant based on collateral estoppel and unopposed by plaintiff. Filed July 11, 1980.

3,850,776. (See 3,826,068.)

3,890,655, Cleo D. Mathis, WHIRLPOOL JET FOR BATHTUBS; **3,890,656,** same; **3,946,449,** same; **D. 244,462,** same, WHIRLPOOL JET NOZZLE FOR BATHTUBS AND THE LIKE, **filed** July 23, 1980, D.C. Nev. (Las Vegas), Doc. CV–LV–80–232 RDF, *Cleo D. Mathis* v. *Hydrodynamics Bath Systems Corp. et al.*

3,890,656. (See 3,890,655.)

3,890,069, SIG Schweizerische Industrie-Gesellschaft, A ROTARY TRANSFER APPARATUS FOR GROUPING ARTICLES, **filed** July 11, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80–2713, *SIG Schweizerische Industrie-Gesellschaft* v. *Tevopharm-Schiedam B.V.*

3,904,092, Paul A. Piper, UNIVERSAL SKI RACK, **filed** July 7, 1980, D.C. Nev. (Reno), Doc. R–80–166 ECR, *Paul A. Piper et al.* v. *Sportif USA, Inc. et al.*

3,939,762, Big Elk Wood Corporation, APPARATUS FOR BUNDLING FIREWOOD; **4,072,004,** same, METHOD FOR BUNDLING FIREWOOD, **filed** Aug. 5, 1980, D.C., Colo. (Denver), Doc. 80–A–1030, *Big Elk Wood Corporation* v. *Carlson Stapler & Shippers Supply, Inc.*

3,946,449. (See 3,890,655.)

4,014,633. (See 3,792,133.)

4,014,648, Microfibres, Inc., IN-LINE FLOCK CUTTING PROCESS, **filed** July 17, 1980, D.C.N.H. (Concord), Doc. 80–351, *Microfibres, Inc.* v. *Claremont Flock Corporation et al.*

4,066,851. (See 3,383,487.)

4,072,004. (See 3,939,762.)

4,074,972, American Monitor Corporation, UREA ASSAY; **4,111,657,** same, CREATININE ASSAY AND REAGENT SYSTEM, **filed** July 1, 1980, D.C. Conn. (Bridgeport), Doc. B–80–329, *American Monitor Corporation* v. *Connecticut Diagnostics, Ltd. et al.*

4,101,708, Schwarzkopf Development Corp., COATED CEMENTED CARBIDE ELEMENTS, **filed** Apr. 24, 1979, D.C., W.D. Pa. (Pittsburgh), Doc. 79–546, *Kennametal Inc.* v. *Schwarzkopf Development Corp.* Case dismissed with prejudice and without costs to either party on June 1, 1980.

4,100,936, Wallace Business Forms, Inc., METHOD OF PRODUCING FORM SUITABLE FOR AIRLINE TICKETING, **filed** July 1, 1980, D.C., N.D. Ill. (Chicago), Doc. 80c3397, *Wallace Business Forms, Inc.* v. *Uarco, Incorporated.*

4,111,657. (See 4,074,972.)

4,116,841, American Hospital Supply Corporation, SEMI-PERMEABLE MEMBRANE MASS TRANSFER APPARATUS HAVING COLLAPSED MEMBRANE ABOUT SUPPORT MEMBERS, **filed** July 16, 1980, D.C., C.D. Calif. (Los Angeles), Doc. 80–03114 RMT (Gx), *Cobe Laboratories, Inc.* v. *American Hospital Supply Corporation.*

4,129,239. (See 3,825,162.)

4,138,427, Tom Loomis, ARROW PACKAGE, **filed** July 1, 1980, D.C. S. Dak. (Pierre), Doc. 80–3042, *Wambli Archery Company* v. *K-Mart Enterprises, Inc. et al.*

4,138,960, Lars R. Bergstrom, SAILBOAT CONSTRUCTION, **filed** Aug. 1, 1980, D.C., M.D. Fla. (Tampa), Doc. 80–886–C–T.K., *Lars R. Bergstrom* v. *Kiwi Boats, Inc.*

4,176,654, Bio-Energy Systems, Inc., SOLAR HEATING APPARATUS, **filed** July 22, 1980, D.C., M.D. Fla. (Tampa), Doc. 80–843–C–T.K., *Bio-Energy Systems, Inc.* v. *Calmac Mfg. Corp. et al.*

4,196,187, Morgan Trailer Mfg. Co., RAMP AND RAMP CARRIER FOR TRUCKS AND THE LIKE, **filed** July 17, 1980, D.C., E.D. Pa. (Philadelphia), Doc. 80–2782, *Ryder Truck Rental, Inc.* v. *Morgan Trailer Mfg. Co.*

4,199,606, Bobby J. Bland, PROPIONIC ACID ON A CARRIER MATERIAL AS A PRESERVATIVE, **filed** July 1, 1980, D.C., N.D. Ga. (Gainesville), Doc. 80–052G, *Anitox Corporation et al.* v. *H. Wilson Manufacturing Co.*

4,205,300, Techne Electronics, Ltd., VEHICLE ANTITHEFT ALARM, **filed** Aug. 4, 1980, D.C., N.D. Calif. (San Francisco), Doc. C–80–3212–SW, *Techne Electronics* v. *Alex's Porsche Parts House, Inc.*

D. 227,365. (See 3,424,189.)

D. 244,462. (See 3,890,655.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,846,254, Re. S.N. 159,894, Filed Jun. 16, 1980, Cl. 203/11, INTERFACE ENHANCEMENT APPLIED TO EVAPORATION OF LIQUIDS, Hugo H. Sephton, Owner of Record: *Inventor,* Attorney or Agent: Bertram I. Rowland, Ex. Gp.: 177

3,997,134, Re. S.N. 133,339, Filed Mar. 24, 1980, Cl. 244/110 B, FUSELAGE TAIL JET ENGINE THRUST REVERSER, George T. Drakeley, Owner of Record: *The Boeing Co., Seattle, Wash.,* Attorney or Agent: Robert W. Beach, et al., Ex. Gp.: 315

4,004,244, Re. S.N. 155,997, Filed Jun. 3, 1980, Cl. 330/300, DYNAMIC CURRENT SUPPLY, Otto Heinrich Schade, Jr., Owner of Record: *RCA Corporation, Princeton, N.J.,* Attorney or Agent: Allen Leroy Limberg, Ex. Gp.: 252

4,094,362, Re. S.N. 155,880, Filed Jun. 2, 1980, Cl. 172/120, APPARATUS FOR FINE GRADING COMPACTED EARTH, Melvin O. Hild, Owner of Record: *Inventor,* Attorney or Agent: Robert Henderson, et al., Ex. Gp.: 334

4,143,226, Re. S.N. 159,126, Filed Jun. 13, 1980, Cl. 536/59, PROCESS FOR PREPARING A SULFATE ESTER OF A POLYHYDROXY POLYMER, Richard G. Schweiger, Owner of Record: *Inventor,* Attorney or Agent: Mario A. Martella, et al., Ex. Gp.: 144

PATENT NOTICES

Certificates of Correction for the Week of Sept. 23, 1980

Re. 30,281	4,188,138	4,202,143	4,207,396
Re. 30,283	4,189,339	4,202,309	4,207,940
3,925,751	4,189,680	4,202,523	4,208,039
3,986,142	4,191,132	4,202,875	4,208,106
4,003,194	4,191,596	4,202,889	4,208,477
4,052,511	4,191,707	4,202,890	4,208,482
4,056,719	4,191,755	4,203,200	4,208,550
4,071,189	4,192,020	4,203,339	4,208,943
4,116,169	4,192,057	4,203,424	4,209,109
4,133,147	4,192,575	4,203,639	4,209,408
4,139,300	4,192,818	4,203,872	4,209,469
4,154,840	4,195,641	4,204,206	4,209,501
4,156,071	4,196,143	4,204,261	4,209,671
4,166,509	4,196,245	4,204,650	4,209,955
4,169,205	4,197,917	4,205,250	4,210,206
4,170,774	4,199,192	4,205,255	4,210,448
4,171,560	4,200,915	4,205,488	4,211,273
4,172,071	4,201,277	4,205,601	4,211,407
4,179,249	4,201,370	4,205,845	4,211,543
4,179,568	4,201,443	4,206,218	4,211,936
4,185,468	4,201,918	4,206,311	4,212,168
4,185,834	4,202,139	4,206,601	4,212,817
			4,215,544

National Technical Information Service

GOVERNMENT-OWNED INVENTIONS

Notice of Availability for Licensing

The inventions listed below are owned by the U.S. Government and are available for domestic and, possibly, foreign licensing in accordance with the licensing policies of the agency-sponsors.

Copies of patents cited are available from the Commissioner of Patents and Trademarks, Washington, D.C. 20231, for $.50 each. Requests for copies of patents must include the patent number.

Copies of patent applications cited are available from the National Technical Information Service (NTIS), Springfield, Va. 22161, for $5.00 each ($10.00 outside North American Continent). Requests for copies of patent applications must include the patent application number. Claims are deleted from patent application copies sold to avoid premature disclosure. Claims and other technical data will usually be made available to serious prospective licensees upon execution of a non-disclosure agreement.

Requests for information on the licensing of particular inventions should be directed to the addresses cited for the agency-sponsors.

DOUGLAS J. CAMPION,
Program Coordinator,
Office of Government Inventions and Patents,
National Technical Information Service,
U.S. Department of Commerce.

DEPARTMENT OF THE ARMY, OTJAG

Chief, Intellectual Property Division, Room 2D 444
Pentagon, Washington, D.C. 20310

Patent application 6-077,862. Cargo Container Transporter. Filed Sept. 21, 1979.

Patent application 6-078,892. Multipurpose Humidity Controlled Agent Generator. Filed Oct. 24, 1979.

Patent application 6-091,227. Engine Simulator to Calibrate RPM and Cam-Dwell Test Sets. Filed Nov. 5, 1979.

Patent application 6-099,262. Doppler Extended Depth of Field Imaging System With Coherent Object Illumination. Filed Dec. 3, 1979.

Patent application 6-114,916. Laser Scanner Transport. Filed Jan. 24, 1980.

Patent application 6-115,819. Kinetic Sabot System. Filed Jan. 28, 1980.

Patent application 6-115,820. Propellant Charge for Blank Ammunition. Filed Jan. 28, 1980.

Patent 4,137,757. Compression Testing Apparatus. Filed Feb. 2, 1978. Patented Feb. 6, 1979. Not available NTIS.

Patent 4,158,503. Heterodyne Optical Correlator. Filed Sept. 30, 1977. Patented June 19, 1979. Not available NTIS.

Patent 4,162,509. Non-Contact Velocimeter Using Arrays. Filed June 21, 1978. Patented July 24, 1979. Not available NTIS.

Patent 4,181,851. Automatic Astroposition Determination Apparatus. Filed Feb. 24, 1978. Patented Jan. 1, 1980. Not available NTIS.

U.S. DEPARTMENT OF THE AIR FORCE

AF/JACP, 1900 Half St., SW., Washington, D.C. 20324

Patent application 6-118,008. High Energy Solid Propellant Composition. Filed Feb. 4, 1980.

Patent application 6-118,384. Modular Multilayer Detector. Filed Feb. 5, 1980.

Patent application 6-126,072. Mask-Slice Alignment Method. Filed Feb. 29, 1980.

Patent application 6-126,073. Physical Deterrent Barrier With Upward Looking Detection Sensor for Intruder Detection System. Filed Feb. 29, 1980.

Patent application 6-126,272. Survivable Satellite Bus Structural Frame. Filed Mar. 3, 1980.

Patent application 6-127,017. Method of Making Integrated Waveguide Cavities. Filed Mar. 4, 1980.

Patent application 6-129,858. Biaxial Shear Force Gauge. Filed Mar. 13, 1980.

Patent application 6-132,454. Device for Generating Simulated Waveforms for an Electronic System Maintenance Trainer. Filed Mar. 21, 1980.

Patent application 6-133,769. All-Flexure Linear Isolation/Suspension System. Filed Mar. 25, 1980.

Patent application 6-134,718. Method and Apparatus for Augmenting Binary Patterns. Filed Mar. 27, 1980.

Patent 4,196,435. Radar Pulse Phase Code Systems. Filed Aug. 21, 1967. Patented Apr. 1, 1980. Not available NTIS.

Patent 4,199,079. Microsphere Loading Device. Filed July 31, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,199,175. Ribbed Flange Modified Seal. Filed Apr. 28, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,199,759. System for Correlating Electronic Distance Measurement and Aerial Photography for the Extension of Geodetic Control. Filed Aug. 10, 1978. Patented Apr. 22, 1980. Not available NTIS.

Patent 4,200,840. Dual Detection Scheme for Compressive Receivers. Filed Oct. 6, 1978. Patented Apr. 29, 1980. Not available NTIS.

Patent 4,200,872. Doppler Compensated Digital Non-Linear Waveform Generator Apparatus. Filed Dec. 13, 1978. Patented Apr. 29, 1980. Not available NTIS.

U.S. DEPARTMENT OF ENERGY

Assistant General Counsel for Patents
Washington, D.C. 20545

Patent application 6-003,558. Side-Welded Fast Response Sheathed Thermocouple. Filed Jan. 15, 1979.

Patent application 6-021,291. Improved Magnetic Encoding Device and Method for Making the Same. Filed Mar. 16, 1979.

Patent application 6-022,896. Cure-in-Place Process for Seals. Filed Mar. 22, 1979.

Patent application 6-029,964. Radiation Detection System. Filed Apr. 13, 1979.

Patent application 6-039,426. Scram Signal Generator. Filed May 15, 1979.

Patent application 957,632. Apparatus for Measuring Resistance Change Only in a Cell Analyzer and Method for Calibrating It. Filed Nov. 3, 1978.

Patent application 966,524. LiCl Dehumidifier/LiBr Absorption Chiller Hybrid Air Conditioning System With Energy Recovery. Filed Dec. 4, 1979.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health, Chief, Patent Branch
Westwood Bldg., Bethesda, Md. 20205

Patent application 6-118,969. Instrument for Measuring True-RMS AC Voltage and AC Voltage Fluctuations. Filed Feb. 5, 1980.

U.S. DEPARTMENT OF THE NAVY
Assistant Chief for Patents, Office of Naval Research
Code 302, Arlington, Va. 22217

Patent application 6–094,250. Rare Earth-Iron Magnatostrictive Materials and Devices Using These Materials. Filed Nov. 14, 1979.

Patent application 6–096,708. Buoy Anchoring System. Filed Nov. 21, 1979.

Patent application 6–098,276. Offset-Pad Bearing. Filed Nov. 28, 1979.

Patent application 6–101,965. Flexible Linear Thermal Array. Filed Dec. 10, 1979.

Patent application 6–107,236. Boost Assisted Missile Launcher. Filed Dec. 26, 1979.

Patent application 6–115,860. Multirate Digital Voice Communication Processor. Filed Jan. 28, 1980.

Patent application 6–123,338. Clutter Filter Using a Minimum Number of Radar Pulses. Filed Feb. 21, 1980.

Patent application 6–125,005. Single Stage Twin Piston Cryogenic Refrigerator. Filed Feb. 27, 1980.

Patent application 6–126,772. Underwater-Mateable Electrical Connector. Filed Mar. 3, 1980.

Patent application 6–126,778. High Torque/Acceleration Stabilized Sensor Platform. Filed Mar. 3, 1980.

Patent application 6–127,707. Direct Reading Capacitance Meter. Filed Mar. 6, 1980.

Patent application 6–128,326. Method of Modifying the Transition Temperature Range of TiNi Base Shape Memory Alloys. Filed Mar. 7, 1980.

Patent application 6–133,238. Position Interlock System for Submarine Masts and Closure. Filed Mar. 24, 1980.

Patent application 6–134,717. Tokamak Plasma Heating With Intense, Pulsed Ion Beams. Filed Mar. 27, 1980.

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Assistant General Counsel for Patent Matters—NASA
Code GP–2, Washington, D.C. 20546

Patent application 6–126,064. Apparatus for Damping Operator Induced Oscillations of a Controlled System. Filed Feb. 29, 1980.

Patent application 6–128,229. Inorganic Spark Chamber Frame and Method of Making the Same. Filed Mar. 7, 1980.

Patent application 6–129,779. Memory-Based Frame Synchronizer. Filed Mar. 12, 1980.

Patent application 6–129,783. Improved Sun-Sensing Guidance System for High-Altitude Aircraft. Filed Mar. 12, 1980.

Patent application 6–130,496. Method and Apparatus for Convection Control of Metallic Halide Vapor Density in a Metallic Halide Laser. Filed Mar. 14, 1980.

Patent application 957,452. Method and Apparatus for Doppler Frequency Modulation of Radiation. Filed Nov. 3, 1978.

Patent 4,188,823. Detection of the Transitional Layer Between Laminar and Turbulent Flow Areas on a Wing Surface. Filed Nov. 27, 1978. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,189,675. Satellite Personal Communications System. Filed May 30, 1978. Patented Feb. 19, 1980. Not available NTIS.

Patent 4,193,388. Portable Heatable Container. Filed Apr. 19, 1978. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,193,693. Velocity Servo for Continuous Scan Fourier Interference Spectrometer. Filed Feb. 24, 1978. Patented Mar. 18, 1980. Not available NTIS.

Patent 4,195,279. Attaching of Strain Gages to Substrates. Filed Feb. 16, 1978. Patented Mar. 25, 1980. Not available NTIS.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
California	Los Angeles Public Library	(213) 626–7555 Ext. 274
	Sacramento: California State Library	(916) 322–4572
	Sunnyvale Patent Library*	(408) 738–5580
Colorado	Denver Public Library	(303) 573-5152 Ext. 223
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4519
Illinois	Chicago Public Library	(312) 269-2814
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1458
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214
Nebraska	Lincoln: University of Nebraska-Lincoln, Love Library	(402) 472-3411
New Hampshire	Durham: University of New Hampshire Library	(603) 862–1777
New Jersey	Newark Public Library	(201) 733-7740
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 790-6291
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Public Library of Cincinnati & Hamilton County	(513) 369-6936
	Cleveland Public Library	(216) 623-2932
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255–7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448–1224**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 224
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Dallas Public Library	(214) 748-9071
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

*Collection organized by subject matter.

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PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF AUGUST 9, 1980

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—R. FRIEDMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy: Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	10-16-79
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director. Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	5-11-79
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthodontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	6-17-80
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director. Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	11-14-79
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	7-11-79
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	12-13-78
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director. Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy; Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-27-79
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—N. ANSHER, Director. Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-29-79
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—A. L. SMITH, Director. Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling.	1-22-79
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	11-9-78
DESIGNS, GROUP 290—C. D. QUARFORTH, Director. Industrial Arts; Household, Personal and Fine Arts.	10-2-79
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—M. M. NEWMAN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-18-80
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	1-13-78
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—B. R. GRAY, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	5-5-80
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director. Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	2-4-79
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—G. M. FORLENZA, Director. Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Misc. Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	4-2-79

Expiration of patents: The patents within the range of numbers indicated below expire during August 1980, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 82nd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,009,837 to 3,102,269, inclusive
Plant Patents	Numbers 2,271 to 2,276, inclusive

REISSUES

SEPTEMBER 23, 1980

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 30,407

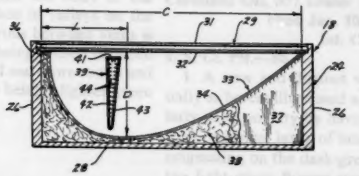
SOLAR HEAT COLLECTOR MODULE

Daniel J. Lightfoot, R.R. No. 3, Box 288A, Glenwood, Iowa 51534

Original No. 4,003,366, dated Jan. 18, 1977, Ser. No. 639,847, Dec. 11, 1975. Application for reissue Jan. 15, 1979, Ser. No. 3,466

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—438 **10 Claims**



7. A fixed position concentrating solar heat collector module for radiantly absorbing solar heat including:

(a) an elongated housing having a transparent cover wall,

(b) a reflector of a concavo-convex hyperbolic shape having a concave reflecting surface with a zone of maximum lateral dimension adjacent one end thereof,

(c) said reflector positioned within and extended longitudinally of said housing with the concave reflecting surface thereof faced toward said cover wall; and

(d) a heat collector tube of an elongated shape in transverse cross section longitudinally mounted within the lateral confines of the arc of said reflector in said zone of maximum lateral dimension, said tube having a pair of linear side walls extended between said cover wall and said reflecting surface, and an end wall located adjacent said transparent cover wall, with each of said side walls being of a width substantially equal to the maximum lateral dimension of the reflector.

PLANT PATENTS

GRANTED SEPTEMBER 23, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,593

POINSETTIA

Cleveland Ott, 677 Grater Ave., Graterford, Pa. 19426

Filed Jan. 10, 1979, Ser. No. 2,259

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein illustrated and described, the body of the bracts being a lighter pink than the parent U.S. Plant Pat. No. 3,392, the pink color being deeper with great illumination, and paling with less illumination, the venation being prominent and rose in color; characterized particularly in that the body of the bracts are rugose, i.e., the veins are sunken in valleys on the upper surface of the bract and the epidermis between veins is elevated or arched, the body of the bract being arched between opposite edges, the bracts being non-lobed and more round and less pointed than in the parent, the foliage being a lighter green than in the parent.

4,594

POINSETTIA

Cleveland Ott, 677 Grater Ave., Graterford, Pa. 19426

Filed Jan. 10, 1979, Ser. No. 2,260

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein illustrated and described, characterized as to novelty by bracts which are a lighter pink than the parent, Annette Hegg Hot Pink (U.S. Plant Pat. No. 3,761) and characterized particularly by much less prominent veins than the parent, the veins of the new variety being almost obscured by a heavy epidermal covering, particularly on the upper side.

4,595

POINSETTIA

Cleveland Ott, 677 Grater Ave., Graterford, Pa. 19426

Filed Jan. 10, 1979, Ser. No. 2,466

Int. Cl.[3] A01H *5/00*

U.S. Cl. Plt.—86 **1 Claim**

1. A new and distinct variety of poinsettia plant, substantially as herein illustrated and described, characterized particularly as to novelty by having from three to six lobed bracts in the uppermost layer of bracts, the stems of these lobed bracts originating on the dark-green plant stem from locations below the light-green flower stem, the stems of these lobed bracts projecting diagonally upwardly through a layer of non-lobed bracts which project outwardly from the light-green flower stem, the bracts and the leaves standing out more erectly and not drooping as much as on the parent or other preceding Annette Hegg variety, the bracts being wide and long and densely spaced.

PLANT PATENTS

GRANTED SEPTEMBER 23, 1980

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawings

4,593

POINSETTIA

Cleveland Ott, 677 Crater Ave., Crestwood, Pa. 19626

Filed Jun. 10, 1979, Ser. No. 2,269

Int. Cl.[3] A01H 5/00

U.S. Cl. PP.—86 1 Claim

1. A new and distinct variety of poinsettia plant, substantially as herein illustrated and described, the body of the bract being a lighter pink than the pistil [U.S. Plant No. 3,762], the pink color being deeper with great illumination, and fading with less illumination, the veinlets being prominent and rose in color, characterized particularly in that the body of the bracts are ruffled, i.e., the veins are sunken in valleys on the upper surface of the bract and the epidermis between veins is elevated or arched, the body of the bract being arched between opposite edges, the bracts being non-lobed and more round and less pointed than in the parent, the foliage being a lighter green than in the parent.

4,594

POINSETTIA

Cleveland Ott, 677 Crater Ave., Crestwood, Pa. 19626

Filed Jun. 10, 1979, Ser. No. 2,269

Int. Cl.[3] A01H 5/00

U.S. Cl. PP.—86 1 Claim

1. A new and distinct variety of poinsettia plant, substantially as herein illustrated and described, characterized in its

PATENTS

GRANTED SEP. 23, 1980

ERRATA

For CLASS	See PATENT NO.
033–148 D	4,223,441
368–204	4,223,521
368–066	4,223,522
368–074	4,223,523
368–156	4,223,524
368–113	4,223,525
368–084	4,223,526
368–283	4,223,527
368–220	4,223,528
074–421 R	4,223,558
474–082	4,223,562
441–041	4,223,630
024–068 CD	4,223,869
209–211	4,224,143
556–478	4,224,233
556–472	4,224,234
568–388	4,224,252
568–445	4,224,253
568–431	4,224,254
568–451	4,224,255
568–006	4,224,256
417–360	4,224,363
424–246	3,224,371
370–084	3,224,473
370–068	3,224,474
370–059	3,224,475
375–028	3,224,571
455–326	3,224,572
346–033 R	3,224,672

PATENTS

GRANTED SEPTEMBER 23, 1980

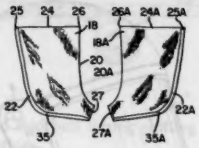
GENERAL AND MECHANICAL

4,223,407
HAIRDRESSING PROTECTIVE VISOR
Mary C. Zappala, 4816 Redwood Dr., Garland, Tex. 75043
Filed Oct. 4, 1978, Ser. No. 948,435
Int. Cl.[2] A61F 9/00; A42D 1/12
U.S. Cl. 2—174 **2 Claims**

1. A visor for protecting a person's face and ears from a hairdressing material applied to the person's hair comprising:
fluid sealing means for forming a fluid-tight seal against the person's skin extending across the person's forehead from one ear to the other, across the tops of both ears and down the back of both ears;
a trough connected on a first edge to said sealing means and extending across the person's forehead from one ear to the other and extending further across the tops of both ears for directing fluids collected by said trough to points behind said ears;
a brim extending from a second edge of said trough along that portion of said trough which extends across the person's forehead; and
a pair of cup shaped earpieces connected to ends of said trough for holding said visor against the person's forehead in sealing fashion and for protecting the person's ears;
said earpieces having upper edges extending from the second edge of those portions of said trough extending across the tops of said ears, rear edges connected to those portions of said sealing means extending down the back of said ears, and forward edges extending down the front of the person's ears in contact with the person's face.

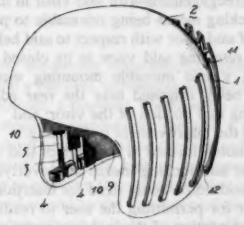
4,223,408
ATHLETIC BRIEFS
Edith Sullivan, 51 Osgood St., Belmont, Mass. 01844
Filed May 14, 1979, Ser. No. 38,778
Int. Cl.[3] A41D 1/08
U.S. Cl. 2—238 **6 Claims**

1. Athletic shorts comprising,
front panel means having a crotch edge and a waistband edge,
back panel means having a crotch edge and waistband edge, said waistband edge having a section cut at a slant,
a pair of briefs, and
an elastic waistband means joining said briefs to said waistband edges of said front and back panel means, said back panel means being overlapped by said front panel means at



sides of said shorts with ends of said overlapped panels being free to move apart.

4,223,409
HELMET PROVIDED WITH SHOCKPROOF AND VENTILATIVE DEVICE
Pei-Hwang Lee, 107, Ming-Chuan Rd., Chia Yi, Taiwan
Filed Apr. 30, 1979, Ser. No. 34,599
Int. Cl.[2] A42B 3/02
U.S. Cl. 2—411 **6 Claims**



1. A protective helmet for protecting the head of a user against shock, and having improved ventilating qualities, said helmet comprising:
a helmet body;
a plurality of spaced elongated plastic strips positioned along the outer surface of said helmet body, said strips being spaced from each other and from said outer surface;
a pair of strip-mounting pads associated with each said strip for securing the two ends of each said strip to said outer surface in spaced relation thereto;
a sponge-like member filling the upper portion of said inner surface, said sponge member having a plastic sheet covering its lower surface and a spaced layer of netting-cloth covering said plastic sheet; and
a plurality of spaced elongated plastic or rubber tubes mounted along the lower portion of said inner surface of said helmet body, said tubes being spaced from each other, at least the central portion of each said tube being spaced from said inner surface.

4,223,410
TILTABLE VISOR FOR HELMETS, IN PARTICULAR MOTORCYCLISTS HELMETS AND SIMILAR

Pierluigi Nava, Verderio Superiore, Como, Italy

Filed Oct. 30, 1978, Ser. No. 955,920
Claims priority, application Italy, Nov. 18, 1977, 22775/77[U]
Int. Cl.[2] A42B 3/02; A61F 9/04
U.S. Cl. 2—424 **5 Claims**

1. A visor-helmet assembly in particular for motorcyclists and the like, comprising:

a helmet having a forward facing opening rimmed by a ledge recessed inward of the adjacent helmet wall;

a transparent visor movably supported on the helmet for closing and uncovering said opening in the helmet, said visor in its closed position having its peripheral edge housed in the outward facing recess defined by said ledge, such that the closed visor is flush with and does not protrude from the outer surface of said helmet;

means movably mounting the end portions of said visor on said helmet beside said opening for permitting movement of said visor to at least partially uncover said helmet opening;

resiliently interengageable locking means respectively fixed on said helment and said visor end portions and opposed for interengagement with said visor in its closed position, said locking means being releasable to permit said movement of said visor with respect to said helmet, said locking means retaining said visor in its closed position on said helmet, a said movable mounting means and locking means being disposed near the rear edge of the corresponding end portion of the visor; and

including the improvement comprising:

a curved notch formed in the edge of said visor end portion adjacent said locking means and overlying said recessed ledge, said notch being sized for insertion of the finger of the user for permitting the user to readily pull the visor mounted portion of the locking means outward from the helmet mounted portion of the locking means, thereby unlocking said locking means, and for permitting movement of said visor guided by said mounting means for uncovering said helmet opening.

4,223,411
INTERNAL LARYNGEAL PROSTHESIS

Donald W. Schoendorfer, Brookline, and Stephen A. Raymond, Carlisle, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 7, 1978, Ser. No. 931,494
Int. Cl.[2] A61F 1/20
U.S. Cl. 3—1.3 **9 Claims**

1. A laryngeal prosthesis one end of which is adapted to be positioned at the inner end of a surgically constructed fistula leading to the base of the user's vocal tract, the other end of said prosthesis being adapted to be connected to the user's tracheostoma,

the prosthesis comprising,

a vibratory mechanism, adapted to be contained within said fistula near to and at the internal opening of the base of the user's vocal tract, said vibratory mechanism comprising a vibratory portion specifically to mimic vocal chord behavior, said vibrating portion not providing valving action,

a tube connected at one end to said vibratory mechanism, said tube being adapted to be within said fistula but also extending beyond the external opening of said fistula so that the other end of said tube is outside the fistula,

a breath port structure having one end connected to the other end of said tube, said breath port structure having

another end adapted to be inserted into the tracheostoma, said breath port structure containing a breath hole capable of being closed when air is to be expelled from the lungs through said breath port structure, said tube, and said vibratory mechanism,

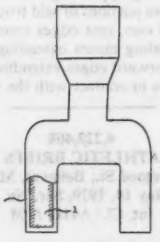
said breath hole when not closed providing an opening adapted to expelling air from the lungs without the air passing through said tube and vibratory mechanism,

said vibratory mechanism being adapted to being removably inserted into the fistula so that the innermost end of the vibratory mechanism is at the base of the vocal tract.

4,223,412
IMPLANTS FOR BONES, JOINTS OR TOOTH ROOTS

Masaya Aoyagi; Mikio Hayashi, both of Kawanishi; Yasuyuki Yoshida, Toyonaka, and Yoshiaki Yao, Takatsuki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 15, 1977, Ser. No. 860,958
Claims priority, application Japan, Dec. 16, 1976, 51-151725
Int. Cl.[3] A61F 1/24; A61C 13/00, 13/30
U.S. Cl. 3—1.9 **4 Claims**



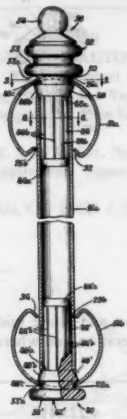
1. An implant comprising a shaped ceramic core having a uniform coating of a porous layer formed by plasma spraying onto the core a mixture consisting essentially of a ceramic material and hydroxyapatite, wherein said hydroxyapatite is present in an amount of 10 to 90% by weight.

4,223,413

BEDSTEAD FRAME ASSEMBLY

Max S. Dresher; Glen E. Dresher, both of Glencoe, and Stanley E. Bontkowski, Wood Dale, all of Ill., assignors to Dresher Manufacturing Co., Chicago, Ill.

Filed Oct. 18, 1978, Ser. No. 952,553
Int. Cl.[2] E04H *17/16*
U.S. Cl. 5—282 R 12 Claims



1. In a frame assembly for use in a bedstead or the like having a pair of lateral standards, and at least one pair of tubular cross rails disposed substantially transverse to said lateral standards and having opposite ends connected thereto, said cross rails having transverse openings fully therethrough so as to cooperate to define at least one pair of axially aligned openings; the improvement therewith comprising at least one spindle disposed between said cross rails and having tubular opposite ends proximate each opening of said at least one pair of axially aligned openings, and means connecting said opposite ends of said spindle to said cross rails, said connecting means including at least one connector member separate from said spindle and adapted to be inserted through one of said pair of axially aligned openings and axially into the corresponding proximate end of said spindle in close fitting relation therewith so as to maintain said corresponding end of said spindle in relatively fixed relation to the corresponding cross rail, said at least one connector member defining a stop surface cooperable with said corresponding end of said spindle for limiting insertion of said connector member and being adapted for snap-fit connection with said corresponding cross rail internally thereof so as to substantially prevent withdrawal of said connector member from said corresponding cross rail.

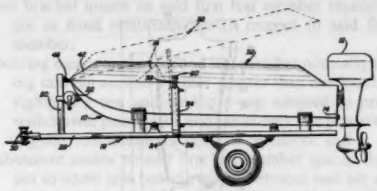
4,223,414

COMBINED TRAILER AND BOAT COVER

Wilson M. Dickson, 115 S. Risk, P.O. Box 1204, Kilgore, Tex. 75662

Filed Dec. 15, 1978, Ser. No. 969,974
Int. Cl.[3] B63B *17/02*
U.S. Cl. 9—1.5 11 Claims

1. In combination with a boat hull of the type including an upwardly opening interior bounded by generally horizontal deck surfaces, predetermined shape cover structure for said boat, including downwardly facing marginal edges, support means supporting said cover structure relative to said boat hull for shifting between a closed position with said marginal edges at least closely overlying said deck surfaces and closing said interior from above and an open position affording access to said interior from above, said support means including a hull support structure from which said hull is stationarily supported, said cover structure being shiftable relative to said hull



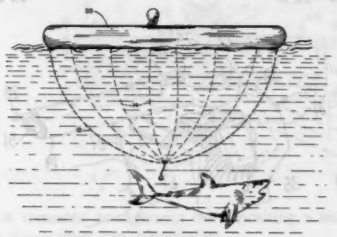
support structure and said hull during shifting between said closed and open positions.

4,223,415

WATERBORNE LIFE-SAVING APPARATUS

James J. Patton, Box 426, Phillipsburg, Kans. 67661

Filed Sep. 13, 1979, Ser. No. 74,931
Int. Cl.[3] B63C *9/00*
U.S. Cl. 9—14 10 Claims



1. A water-borne life-saving apparatus, comprising: a raft having a bottom and a buoyant, peripheral wall secured to and rising from said bottom; a buoyant, horizontally oriented peripheral member spacedly surrounding the raft; a plurality of elements spaced about and secured to the raft and extending horizontally outwardly from the raft to and secured to the peripheral member to maintain the spaced relation between the raft and member and to add to the buoyancy of the raft; and a water-containable bag closed at its bottom and sides and having its top peripheral edge secured to the peripheral member, said bag descending from the peripheral member and forming a water-containing shark screen around and below the raft.

4,223,416

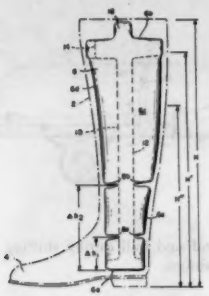
BOOT SUPPORT

Robert J. Sauer, P.O. Box 187, Holbrook, Mass. 02343

Filed Mar. 7, 1979, Ser. No. 18,126
Int. Cl.[3] A43D *5/00*; A43B *3/26*
U.S. Cl. 12—114.6 4 Claims

1. A boot support comprising an elongated one-piece solid plastic member having a shape generally approximating that portion of a human leg between the ankle and knee, said member having a plurality of sets of oppositely facing horizontal grooves, each set being located at a selected level measured from the base of said member, said groove sets establishing

break-off locations for reducing the overall height of said member to accommodate different boot heights, and an integrally molded handle protruding vertically from the top surface of said member.

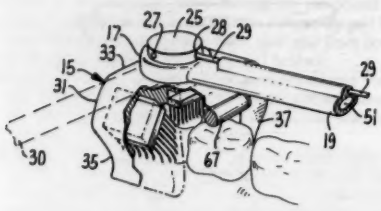


4,223,417

GLIDING, MECHANIZED TOOTHBRUSH

Terry S. Solow, 410 Playa Blvd., La Selva Beach, Calif. 95076

Filed Jan. 31, 1979, Ser. No. 8,064
Int. Cl.[2] A46B *13/02*
U.S. Cl. 15—22 R **18 Claims**



1. A mechanized toothbrush for cleaning both sides of a tooth simultaneously, said toothbrush having a housing adapted to be moved along a row of teeth comprising a head portion and a handle portion, said head portion containing a pair of brushes, each of said brushes being individually movable with respect to said head, said brushes having bristles set at an acute angle to the sides of the tooth, pointing toward the sulcus, said brushes being adapted to move toward and away from each other during vibration, said brushes being adapted to contact opposite sides of the tooth, and means to vibrate said brushes to contact and clean opposite sides of a tooth simultaneously.

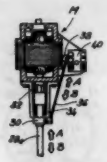
4,223,418

DEVICE FOR QUICKLY WASHING KITCHENWARE, GLASSES, POTS AND THE LIKE

Ivano Pedrini, Via dei Mille,, 22-S. Giuliano Milanese (Milanese), Italy

Filed Jan. 25, 1979, Ser. No. 6,559
Claims priority, application Italy, May 24, 1978, 21931/78[U]
Int. Cl.[3] A46B *13/02*
U.S. Cl. 15—28 **2 Claims**

1. A device for quickly cleaning, de-scaling, washing and polishing kitchenware, glasses and in particular pots and the like, which comprises a rotating brushing tool, a handle associated thereto, said brushing tool being shiftable to be presented in a variety of positions and orientations, an energy source which comprises an electric motor mechanically coupled to said brushing tool, by means of a flexible driving system; a switch effective to activate and deactivate said electric motor, said flexible driving system driving remotely said switch through an electroinsulating element, a box-supporting member effective to support and house said brushing tool, when said device is not in operation, and wherein said motor and said switch are enclosed.

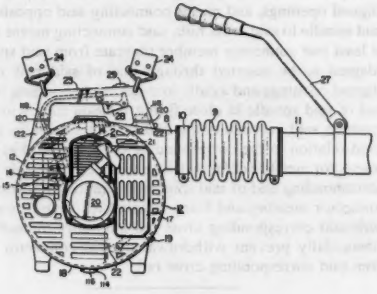


4,223,419

SHOULDER-SUPPORTED PNEUMATIC SWEEPING APPARATUS

Masatoshi Sato, Tokyo, and Hidenori Kajiyoshi, Koganei, both of Japan, assignors to Kioritz Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 897,328, Apr. 18, 1978, abandoned. This application Sep. 7, 1979, Ser. No. 73,585
Claims priority, application Japan, Feb. 15, 1978, 53-18261[U]
Int. Cl.[3] A47L *5/14*
U.S. Cl. 15—327 C **3 Claims**



1. A shoulder-supported pneumatic sweeping apparatus comprising:
- a frame;
- a light weight engine mounted in said frame;
- a fan mounted on an output shaft of said engine in said frame;
- an outlet port formed in said frame for an air current produced by the rotation of said fan;
- a grip having a throttle valve trigger and an engine stop switch located on an upper portion of said frame;
- means isolating said grip from vibration imparted to said frame by operation of said engine;
- means detachably securing said grip and said isolating means in said frame;
- a shoulder strap connected to opposite ends of the upper portion of said grip;

an air ejecting pipe connected to said outlet port through a flexible pipe; and

an operating handle attached to said air ejecting pipe, said operating handle extending upwardly sidewards,

whereby said frame can be supported by the shoulder of the operator by means of said shoulder strap and a pneumatic sweeping operation can be performed while the operator holds the grip in one hand and the operating handle in the other hand.

4,223,420

HINGE STRUCTURE FOR AUTOMOBILE HOODS

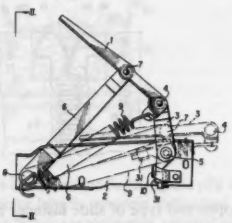
Kazuyoshi Yukimoto, Toyota; Shinzi Ogasawara, Hekinan; Mitsuhiro Sakamoto, Toyota, and Yasunori Kawamura, Nagoya, all of Japan, assignors to Aisin Seiki Company, Limited, Kariya, Japan

Filed Oct. 5, 1978, Ser. No. 948,916

Claims priority, application Japan, Oct. 5, 1977, 52-134109[U]

Int. Cl.[2] E05D *1/00*

U.S. Cl. 16—128.1 **8 Claims**



1. A hinge structure for a hood and body of an automobile, which comprises:

a first bracket fixedly connected to said automobile's hood;

a second bracket fixedly connected to said automobile's body;

a link mechanism rotatably supporting said first and second brackets by means of first and second link members, said first link member having an axis of rotation;

means connected to said first bracket for urging said first bracket in a direction so as to raise said first bracket and said hood;

a link connecting member mounted on said second bracket member and an elastic member fixed to said automobile body adjacent said axis of rotation of said first link member wherein one end of said first link member is fixedly inserted into said link connecting member upon fully opening said automobile hood and is positively connected by the frictional resistance between the biasing force of said link connecting member and said elastic member.

4,223,421

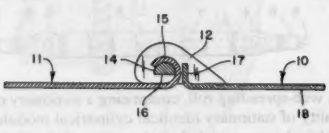
SEPARABLE HINGE

Adelbert D. Wassenaar, 167 Rosemary, SE., Grand Rapids, Mich. 49507

Filed Sep. 13, 1978, Ser. No. 941,970

Int. Cl.[2] E05D *7/10*

U.S. Cl. 16—172 **4 Claims**



1. A separable hinge assembly including first and second leaf members and a pin normally interengaging said leaf members to provide a pivotal connection, said hinge assembly having a freedom of articulation of substantially one hundred and eighty degrees, wherein the improvement comprises:

pin bracket means on said first leaf member receiving said pin in fixed relationship with respect to said first leaf member;

bearing means on said second leaf member normally embracing said pin around a sector greater than one hundred and eighty degrees, and having a gap adapted to provide a withdrawal passage for said pin in only one predetermined angular relationship of said leaf members; and

abutment means on said first leaf member spaced from said pin to admit said bearing means between said pin and said abutment means said gap being disposed to provide withdrawal with said leaf members in substantially parallel relationship.

4,223,422

TURNTABLE FOR DEPOSITING A FIBER SLIVER INTO A SPINNING CAN

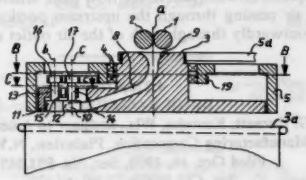
Kurt Weber, Elgg, Switzerland, assignor to Rieter Deutschland GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 2, 1979, Ser. No. 532

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2801010

Int. Cl.[2] B65H *54/80*

U.S. Cl. 19—159 R **13 Claims**



1. A turntable arrangement for depositing a moving fiber sliver into a sliver can, comprising:

a turntable having a rotational axis;

said turntable being provided with a sliver duct through which passes the fiber sliver;

calender rolls provided for the turntable;

said calender rolls, viewed in the direction of movement of the fiber sliver, being arranged after the sliver duct and rotating together with the sliver duct;

each calender roll having a rotational axis; and

each calender roll being arranged such that its rotational axis extends substantially parallel to the rotational axis of the turntable;

said calender rolls define two calender rolls; and the rotational axes of the calender rolls and the rotational axis of the turntable are located at least substantially in one plane.

4,223,423

COTTON LINT CLEANER

John E. Foerster, Route 1, Box 70, Lubbock, Tex. 79401

Division of Ser. No. 665,099, Mar. 8, 1976, Pat. No. 4,102,017.

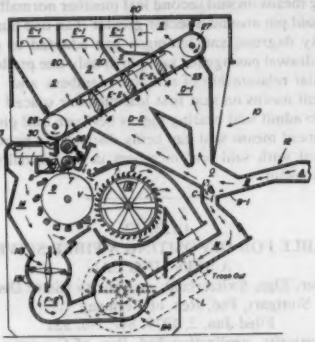
This application May 12, 1978, Ser. No. 905,551

Int. Cl.[2] D01B *1/00*

U.S. Cl. 19—203 **4 Claims**

1. In a cotton lint cleaner comprising a chamber having inlet means for a mixture of air and cotton to be cleaned with the inlet means defining a flow path, means providing a pressure differential in the flow path to cause movement of the air and cotton mixture along the flow path, that improvement comprising a condenser in the form of a porous endless belt disposed transversely of the flow path whereby cotton will be deposited on the belt and air will pass therethrough, means

movably supporting said belt for moving the cotton deposited on the belt outwardly of the flow path for removal from the belt, said means movably supporting said belt including a pair of parallel end rollers over which the belt is entrained to provide the belt with spaced parallel portions with cotton being deposited on the portion of the belt disposed upstream of the



flow path, air outlet means disposed between the parallel portion of the belt and forming a portion of the flow path and air outlet means disposed in spaced relation to the portion of the belt disposed downstream of the flow path, whereby a portion of the air passing through the upstream portion of the belt passes outwardly through each of the air outlet means.

4,223,424

BANK BAG SEALER

Ralph G. Burnett, Kenosha, Wis., assignor to American Casting and Manufacturing Corporation, Plainview, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,569

Int. Cl.[2] B65D *77/10, 63/00*

U.S. Cl. 24—30.5 R **10 Claims**

1. A sealing device for a receptacle having at least one open end, which receptacle consists at least in part of deformable material adjacent the open end thereof, so that the material may be gathered together to form a neck, said sealing device comprising a relatively thin band of flexible material which is of sufficient strength that it is manually severable only by cutting through the same, said band comprising an elongated flat body portion and a pair of end portions at the extremities thereof, means for tightly securing the body portion of said band circumferentially about the neck of said receptacle adjacent to said end, with said end portions extending outwardly from the circumferential body portion, means on said band for preventing the seal from being opened to gain access to said receptacle without severing or damaging the band, a plurality of projections formed on one side of the body portion of the band at substantially right angles to the length thereof and bent in one direction toward one end of the band, and locking means adjacent said one end of the band for engaging one or more of said projections, said locking means and said projections permitting relative movement of said band in one direction relative to said locking means and substantially preventing relative movement thereof in the other direction, said locking means comprising a pair of oppositely formed panels extending at substantially right angles to the length of said strip to provide a pair of slits in said band through which the other end of the band is inserted a sufficient distance for at least two of said projections to engage with the edge of one of said panels and with an edge in the strip formed by the other of said panels being locked in position thereby to prevent substantial movement of said second end of the band away from the locking means.

4,223,425

SLIDE FASTENER

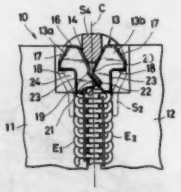
Shunji Akashi, Kurobe, Japan, assignor to Yoshida Kogyo K.K., Tokyo, Japan

Filed Feb. 2, 1979, Ser. No. 9,171

Claims priority, application Japan, Feb. 21, 1978, 53-20982[U]

Int. Cl.[2] A44B *19/36*

U.S. Cl. 24—205.11 R **3 Claims**



1. In an open end type of slide fastener comprising a pair of stringer tapes each carrying a row of interlocking fastener elements along one longitudinal edge and a slider having side flanges and a diamond and adapted to open and close the fastener, the improvements comprising an end stop consisting of a pair of lugs formed from a plastic material and secured to the longitudinal edges of the respective stringer tapes, said lugs each having an oblique inner edge extending divergently with respect to the longitudinal axis of the fastener such that said lugs define therebetween a substantially V-shaped opening complementary in shape with the diamond of the slider, and one of said pair of lugs having at least one projection contiguous to said oblique inner edge and the other lug having a recess receiving said projection, said projection extending transversely beyond the central longitudinal axis of the rows of interengaged fastener elements and disposed for abutting engagement with the slider diamond.

4,223,426

WEB SPREADING ROLL

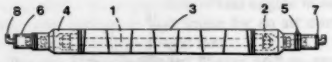
Armand Demiere, Epalinges, Switzerland, assignor to Arcomac S.A., Lausanne, Switzerland

Continuation-in-part of Ser. No. 788,882, Apr. 19, 1977. This application Jun. 26, 1979, Ser. No. 52,235

Claims priority, application Switzerland, Apr. 30, 1976, 5435/76

Int. Cl.[3] D06C *3/06*

U.S. Cl. 26—103 **6 Claims**



1. A web-spreading roll, comprising a stationary central rod, a plurality of stationary identical cylindrical modules having a symmetrical trapezoidal-shaped section along their axis, said modules being disposed on said rod in an identical fixed angular position to each other, stressing means disposed at both ends of said rod to impart stress to the rod in its lengthwise

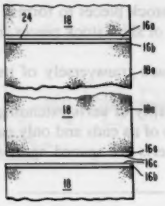
direction and to urge said modules together in frictional engagement to each other, thus imparting to said stationary rod with said stationary modules an arcuate shape, the radius of the arc depending on said angular position, a plurality of identical cylindrical sleeves disposed along said modules, means disposed between said modules and said sleeves for permitting rotation of the sleeves around said modules, and means associated with said sleeves for assuring simultaneous and uniform rotation of all sleeves together.

4,223,427

METHOD OF KNITTING AND OF PROCESSING HIGH PILE FABRIC

David Pernick, 1020 Shore Blvd., Brooklyn, N.Y. 11235

Filed Oct. 16, 1978, Ser. No. 951,859
Int. Cl.³ D06C *11/00, 13/00, 23/02;* D05B *1/00*
U.S. Cl. 28—159 **4 Claims**



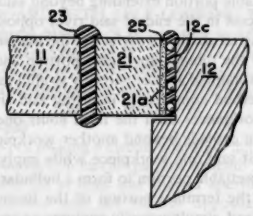
1. Improvement in a process for finishing the pile of high pile knit fabric of indefinite length wherein individual lengths of tubular high pile knit fabric are walewise, severed and are then coursewise joined in end-to-end relation to provide the indefinite length of the high pile knit fabric preparatory to the processing of the pile thereof, and wherein the improvement includes the steps of providing the individual lengths of tubular high pile knit fabric during the knitting thereof with terminal courses which are substantially free of the pile, and the step of coursewise joining the fabric of said pile-free terminal courses of said individual lengths of said pile knit fabric in end-to-end relation to provide the indefinite length thereof preparatory to the processing of its pile, the fabric of said pile-free terminal courses not being subjected to the processing operation and being subsequently treated as disposable waste material.

4,223,428

METHOD AND APPARATUS FOR SECURING A FERROELECTRIC STACK TO A WEIGHTED PROJECTION SURFACE

Jack W. Holloway, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 201,706, Nov. 24, 1971. This application Jul. 2, 1973, Ser. No. 375,570
Int. Cl.³ H04R *17/00*
U.S. Cl. 29—25.35 **4 Claims**



1. A method for securing a ferroelectric stack to a weighted projection surface having a given coefficient of thermal expansion comprising:

bonding a coupler ring onto an axial projection of said stack said ring having an exposed axial surface and having nearly the same coefficient of thermal expansion as said stack but different from said weighted projection surface;

wiping a thin film of silicone compound onto the exposed axial surface of said ring to provide a bonding inhibiting surface;

shaping an area of said projection surface to mate with said exposed axial surface;

coating the shaped area with a liquid adhesive;

placing said shaped area against the bonding inhibiting exposed axial surface while said liquid adhesive is fluid; and

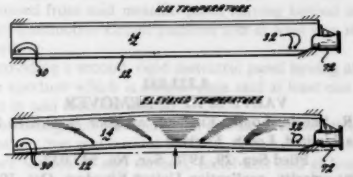
heating the fluid adhesive for a time to harden it to form a rigid joint with said shaped area and a radially slideable joint with said thin film to mechanically decouple said stack from the differing magnitudes of thermal expansion of said weighted projection surface while maintaining a high impedance match across both joints.

4,223,429

PROCESS FOR BONDING MAIN ROTOR BLADES FROM PARTS HAVING DIFFERENT COEFFICIENTS OF THERMAL EXPANSION

Frank D. Robinson, Rancho Palos Verdes, Calif., assignor to Robinson Helicopter Company, Torrance, Calif.

Filed Sep. 1, 1978, Ser. No. 938,930
Int. Cl.³ B23P *15/04*
U.S. Cl. 29—156.8 B **14 Claims**



1. A process for bonding together into a composite structure parts having different coefficients of thermal expansion by means of an adhesive which cures at a curing temperature different from a use temperature at which the structure is to be used, the process comprising the steps of:

applying the adhesive in an uncured state to the parts;

affixing the parts together rigidly at the use temperature to form the composite structure prior to curing the adhesive; and,

curing the adhesive at the curing temperature while keeping the parts affixed together and simultaneously permitting the composite structure to bow in accordance with the different coefficients of thermal expansion of the parts.

4,223,430

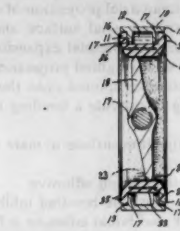
METHOD FOR MAKING SEAT ASSEMBLY FOR BUTTERFLY VALVES

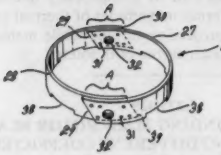
Michael Sherlaw, Dollard-des-Ormeaux, Canada, assignor to Crane Co., New York, N.Y.

Filed Dec. 1, 1978, Ser. No. 965,540
Int. Cl.³ B23P *15/00;* B29C *6/00*
U.S. Cl. 29—157.1 R **7 Claims**

1. A method of making a resilient valve seat assembly having a flexible ring therein for a butterfly valve comprising, providing two substantially C-shaped circular band segments each having circumferential ends with the ends of each segment having holes therein forming a flexible circular band by overlapping the ends of the two part circular band segments with the holes in alignment and joining the overlapped ends together, therein supporting the circular band in a fixed spatial

position, positioning a mold about but spaced from the band while the band is supported, and molding an annular seat





member from resilient material while the mold is positioned about the band to substantially embed the band within the seat member.

4,223,431

VALVE SPRING REMOVER

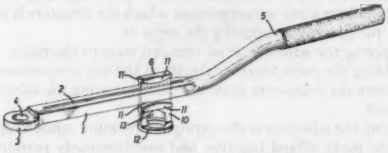
Louis R. Skeels, Louth, England, assignor to G.K.L. Special Tools Limited, Louth, England

Filed Sep. 29, 1978, Ser. No. 947,032

Claims priority, application United Kingdom, Oct. 19, 1977, 40387/77

Int. Cl.[3] B23P 19/04

U.S. Cl. 29—219 8 Claims



1. A portable hand tool for facilitating the removal or mounting of valve springs of overhead valve internal combustion engines, comprising a hand lever apertured at one end to receive an upstanding bolt or stud on the cylinder head such that the end of the lever can be held down by a screw threaded member on the bolt or stud and yet the lever can be pivoted at least over a limited arc, in a vertical plane about the connection to the bolt or stud, the lever having a rail in its intermediate section, and an adaptor loosely mounted for free longitudinal sliding movement along the rail and for limited pivotal movement with respect to the rail, the adaptor having a downwardly facing opening for receiving the upper end of a valve stem while the lower side of the adaptor is stably pressing against a retaining collar for the upper end of the valve spring, the adaptor also being arranged to give lateral access to collets or other means for holding the spring against upward movement relative to the valve stem when such means are released by compression of the spring by the lever.

4,223,432

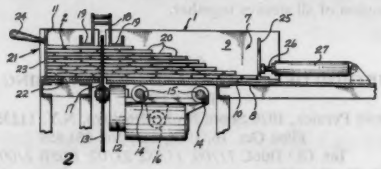
SHIM BUNDLE AND METHOD OF MAKING THE SAME

Charles E. Carr, Olympia, Wash., assignor to Carr Cedar Products, Inc., Shelton, Wash.

Filed Oct. 23, 1978, Ser. No. 953,960

Int. Cl.[3] B23P 17/00

U.S. Cl. 29—417 11 Claims



1. The method of forming a bundle of shims which comprises, in sequence:

(1) stacking shim stock pieces to form a shim stock lay-up;

(2) cutting a pack of shim stock pieces from an end portion of the lay-up;

(3) banding the pack transversely of its length to form a bundle; and

(4) forming a plurality of kerfs extending lengthwise of the bundle from one of its ends and only partway through the bundle which kerfs are spaced apart transversely of the bundle.

4,223,433

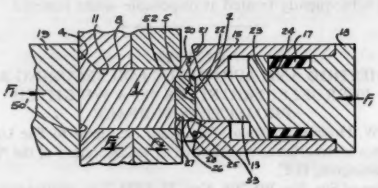
METHOD OF JOINING WORKPIECES WITH A RIVET FASTENER SYSTEM

Irwin E. Rosman, 23710 Clarendon St., Woodland Hills, Calif. 91364

Division of Ser. No. 681,431, Apr. 29, 1976, Pat. No. 4,126,076, which is a division of Ser. No. 549,330, Feb. 12, 1975, Pat. No. 3,995,406, which is a continuation-in-part of Ser. No. 360,533, May 15, 1973, abandoned, and Ser. No. 480,760, Jun. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 321,457, Jan. 5, 1973, abandoned. This application Jun. 12, 1978, Ser. No. 914,858

Int. Cl.[2] B21D 39/00; B23R 11/00

U.S. Cl. 29—509 1 Claim



1. A method of joining workpieces by setting a two-piece rivet assembly, which rivet assembly comprises a rivet with a head and a central axis, a solid shank of substantial length, and a tubular upsettable portion extending beyond said solid shank formed by a recess in the end of said rivet opposite from the head, there being an abutment surface at the intersection of the solid shank and the tubular upsettable portion and a core pin inside the recess adapted at least partially to abut said abutment surface, said method comprising: inserting said rivet through holes in said workpieces until the head abuts one workpiece and the core pin extends beyond another workpiece, holding said head against said one workpiece while applying an axial force on said upsettable portion to form a bulbular upset head, during at least the terminal portion of the formation of the bulbular upset head, simultaneously applying an axial end force to the core pin to press it axially against said abutment surface

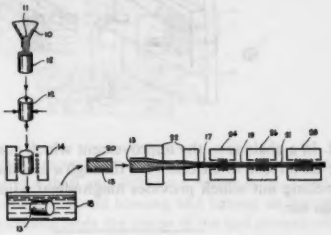
to cause the solid shank to expand principally as a consequence of columnar axial loading.

4,223,434

METHOD OF MANUFACTURING A NIOBIUM-ALUMINUM-GERMANIUM SUPERCONDUCTIVE MATERIAL

John L. Wang, San Francisco; Milton R. Pickus, Oakland, and Kent E. Douglas, Redondo Beach, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 1, 1979, Ser. No. 8,622
Int. Cl.[2] H01V *11/00*; B22F *3/24*
U.S. Cl. 29—599 **10 Claims**



1. A method for manufacturing a flexible superconductive material containing interconnecting filaments of a $Nb_3(Al, Ge)$ superconductive phase comprising the steps of:

a. forming a porous niobium compact having a network of interconnecting pores;

b. sintering the thus formed niobium compact;

c. infiltrating into the interconnecting pores of the sintered compact an aluminum-germanium alloy by passing the sintered compact through a molten bath of the alloy so that the alloy infiltrates into and substantially fills the pores of the sintered compact to form a composite;

d. deforming the composite to elongate infiltrant alloy so that the alloy extends as filaments through the composite;

e. first, heating the deformed composite to a temperature sufficient to cause the infiltrated alloy to react with niobium and separate into two phases, one, which is composed almost entirely of germanium and another, which is peripheral to the germanium phase and is composed basically of aluminum reacted with niobium;

f. second, heating the composite to a second higher temperature so that a germanium-rich germanium-aluminum-niobium phase is formed peripheral to the aluminum-niobium phase, and;

g. third, heating the composite to a third temperature higher than the second temperature such that aluminum diffuses through the germanium rich phase and forms a $Nb_3(Al, Ge)$ superconductive phase peripheral to the germanium phase.

4,223,435

CIRCUIT BOARD WITH SELF-LOCKING TERMINALS

Joseph A. Roberts, Hudson, N.H., assignor to Advanced Circuit Technology, Merrimack, N.H.

Continuation-in-part of Ser. No. 808,808, Jun. 22, 1977, Pat. No. 4,107,836. This application Aug. 21, 1978, Ser. No. 934,702
Int. Cl.[2] H05K *3/06*
U.S. Cl. 29—830 **9 Claims**

1. A method of making a circuit board having (i) at least one electrically conductive circuit pattern formed on a surface of said board, and (ii) at least one shaped aperture formed between said surface and the surface opposite thereto, said method comprising the steps of:

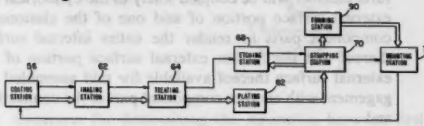
(A) providing a resiliently flexible metallic panel;

(B) removing material from selected areas on one surface of said metallic panel while leaving (i) a substantially continuous metallic panel having (ii) at least one raised area, (iii) at least one area of reduced cross-section bounded by said at least one raised area, and (iv) at least one shaped aperture in said at least one area of reduced cross-section;

(C) removing material from the opposite surface of said metallic panel from selected areas opposite said at least one raised area;

(D) providing a first, dielectric panel having at least one aperture of approximate shape and location as said at least one raised area, and aligning and securing said first dielectric panel to said metallic panel so as to cover said one surface of said metallic panel at least in part while leaving substantially uncovered said at least one raised area;

(E) masking selected areas on the other surface of said metallic panel so as to leave uncovered (i) areas opposite said at least one raised area and including (ii) boarder areas surrounding said raised areas;



(F) plating the uncovered areas on both surfaces of said metallic panel and removing said mask;

(G) chemically milling said metallic panel employing the resulting plated areas as resist whereby metallic material is removed from said metallic panel leaving behind one or more conductive circuit patterns and at least one shaped aperture;

(H) providing a second, rigid dielectric panel having at least one aperture which is smaller than said at least one aperture in said metallic panel;

(I) positioning said metallic panel and said second dielectric panel so that said second dielectric panel is adjacent said other surface of said metallic panel and said at least one aperture in said metallic panel and said at least one aperture in said second, relatively rigid dielectric panel are substantially aligned with one another; and

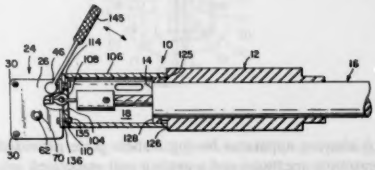
(J) securing said second dielectric panel and said metallic panel to one another.

4,223,436

SPLICE ASSEMBLY TOOL AND METHOD OF SPLICING

Frank A. Silva, Basking Ridge, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Feb. 14, 1978, Ser. No. 877,683
Int. Cl.[2] H01R *43/00*
U.S. Cl. 29—869 **21 Claims**



1. A manually-operated splice assembly tool for applying an assembly force to elastomeric component parts of an electrical connection to produce a splice connection in the field between a pair of electrical cables, with the elastomeric component parts being in assembled engagement, one over the other, in an interference fit, at least one of the elastomeric component parts being generally tubular and having an internal surface and an external surface including a cylindrical end external surface portion, a further external surface portion and an external

shoulder between the end external surface portion and the further extenal surface portion, said tool comprising:

force applying means enabling a rotary force applied manually thereto to be converted into a longitudinal force;

a first structural member for supporting the force applying means;

a second structural member;

a substantially flexible transmission means coupled between the first and second structural members, said transmission means transmitting said longitudinal force between said first and second structural members;

first coupling means for coupling the first structural member to said one of the elastomeric component parts, the first coupling means including circular-shaped means having an open end for receiving therein said cylindrical end external surface portion and abutting against the external shoulder of the external surface whereby the first structural member will be coupled solely to the cylindrical end external surface portion of said one of the elastomeric component parts to render the entire internal surface thereof and the further external surface portion of the external surface thereof available for said assembled engagement with another component part of the connection; and

second coupling means for coupling the second structural member to the other of said elastomeric component parts such that the required assembly force is provided solely by the longitudinal force transmitted by the transmission means during assembly.

4,223,437

SHAVING APPARATUS

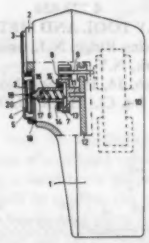
Ebbe Boiten, and Jochem J. De Vries, both of Drachten, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 28, 1978, Ser. No. 946,767

Claims priority, application Netherlands, Nov. 28, 1977, 7713043

Int. Cl.[2] B26B *19/16*

U.S. Cl. 30—43.6 **4 Claims**



1. A shaving apparatus having a shear plate provided with hair-entrance apertures and a cutting unit associated with and drivable relative to the shear plate; said cutting unit comprising a cutting member, cutters extending from said cutting member toward the shear plate, each cutter having a guide wall, lead cutters respectively associated with and movable relative to the cutters, each lead cutter engaging the guide wall of its associated cutter, and an extension provided on one of the lead cutter and the cutter for engagement with the other of the lead cutter and the cutter in order to position the lead cutter relative to the cutter under pre-tension.

4,223,438

DIRECT BAR OILER FOR CHAIN SAWS

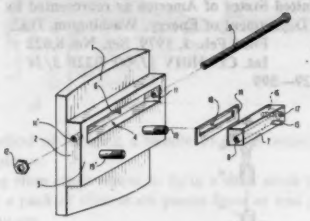
Ronald L. Kerrison, Rosevears P.O., West Tamar, Tasmania 7251, Australia

Continuation-in-part of Ser. No. 837,769, Dec. 19, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,896

Claims priority, application Australia, Dec. 31, 1976, PC8651

Int. Cl.[3] B27B *17/12*

U.S. Cl. 30—123.4 **7 Claims**



1. In a chain saw, the improvement which comprises carrying the oil feed to the chain bar through a modified form of the travelling nut which provides longitudinal adjustment of the chain bar.

4,223,439

MANUALLY OPERATED CUTTING PLIERS FOR CABLES, WIRES, PROFILES OR THE LIKE

Reiner Rommel, Moldaustrasse 6, 3570 Stadt Allendorf, Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,291

Claims priority, application Fed. Rep. of Germany, Jul. 25, 1978, 2832561

Int. Cl.[3] B26B *13/16*

U.S. Cl. 30—250 **9 Claims**

1. Manually operated cutting pliers for cables, wires and profiles, comprising: two hinged plier grips spread apart by spring action; one of said plier grips having a fixed cutting jaw forming a workpiece support, said fixed cutting jaw having a free outer end, a second movable cutting jaw placeable about a workpiece and pivotally mounted at said free end, a closure drive actuated by another plier grip, said second jaw having teeth on the outside meshing with said closure drive after placement about the workpiece, said teeth comprising a gear segment with teeth located about a circular base abutted around the pivoted mounting of said second jaw, said closure drive comprising a toggle lever drive actuated by said movable jaw and extending into said gear segment; said jaws being

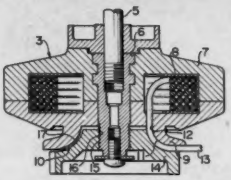
movable relative to each other about a pivot point at ends facing away from ends of the plier grips.

4,223,440

CORD-TYPE MOWING MACHINE

Hisashi Inaga, Takaidonishi, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Nov. 16, 1978, Ser. No. 961,459
Claims priority, application Japan, Aug. 4, 1978, 53-95059
Int. Cl.³ A01D *35/26, 55/18*
U.S. Cl. 30—276 **8 Claims**



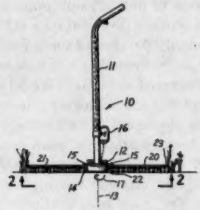
1. A cord-type mowing machine comprising a housing fixedly secured to a shaft and defining a rotary head, a coil of nylon cord contained in said housing and having an uncoiled end portion extending from the inside of the coil downwardly through the bottom of the housing at a point spaced apart radially from an axis of the shaft, a bellmouth-like socket mounted on the underside of said housing and having an outer diameter less than that of said housing, a groove formed in said socket along its inner arcuate surface for guiding and deflecting radially outwardly the end portion of said cord to form a radially extending free traveling portion of said cord, and a retainer threadedly engaging the lower end of said shaft for holding said end portion of the cord in the groove in said bellmouth-like socket.

4,223,441

FLAIL FOR A ROTARY VEGETATION CUTTER

Robert G. Everts, 2118 Birchwood Ave., Mesa, Ariz. 85204

Filed Feb. 2, 1977, Ser. No. 764,825
Int. Cl.³ A01D *55/18;* A01G *3/06*
U.S. Cl. 30—347 **4 Claims**



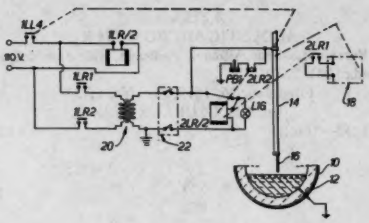
1. In combination: a rotor having an axis of rotation, and a flail held by and turned around the axis of rotation, said flail comprising: a plurality of metal filaments braided into an elongated strand having a dimension of length and a pair of ends, and an abradable jacket surrounding and embracing said strand, one end of said flail being connected to said rotor to be rotated around the said axis of rotation, said flail, when rotated around said axis, striking objects in its path, the jacket near its free end abrading away to expose the strand adjacent to its free end, the strand thereafter unraveling where the jacket is abraded away, there to form a group of loose metallic free filament ends to cut vegetation.

4,223,442

DISTANCE MEASUREMENT

Kerry Hill, Bakewell, and Edward Butterworth, Sheffield, both of England, assignors to British Steel Corporation, England

Filed Aug. 16, 1978, Ser. No. 934,252
Claims priority, application United Kingdom, Aug. 26, 1977, 35930/77
Int. Cl.³ G01F *23/00*
U.S. Cl. 33—126.7 A **11 Claims**



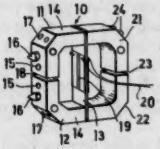
1. Apparatus for determining the separation between first and second relatively movable objects comprising means connected to a first object for applying an electrical voltage to said first object, earth leakage current detection means electrically connected to said first object operable, upon establishment of an earth leakage current from said first object to earth through a second object connected to earth, when said first object contacts said second object, a circuit breaker triggered by said earth leakage current break an earth leakage circuit, and electrical means activated by said circuit breaker to initiate a reading on distance measuring means for recording the separation between the two objects.

4,223,443

STRAIN PICK-UP FOR TESTING OF MATERIALS

Volker Bachmann, St. Augustin; Horst Nowack, Vollmarstein, and Karl-Heinz Trautmann, St. Augustin, all of Fed. Rep. of Germany, assignors to Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V., Cologne, Fed. Rep. of Germany

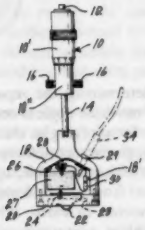
Filed Apr. 9, 1979, Ser. No. 28,537
Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816444
Int. Cl.³ G01B *5/00*
U.S. Cl. 33—148 D **6 Claims**



1. A strain pick-up for testing of materials, comprising:
a pair of tapping points applicable against a test piece;
a pair of rigid elbow members each supporting one of said tapping points, the distance between said tapping points and hence between said elbow members changing within limits upon deformation of said test piece;
a deflection plate secured to said elbow members remote from said tapping points,
at least one wire strain gauge mounted on said deflection plate; and
two additional elbow members fixed to the side of said

deflection plate remote from the tapping points, the free ends of said additional elbow members being separated from one another by an air gap.

4,223,444
ACOUSTIC MICROMETER
Henri Perreault, 64 rue Albanel, Radisson, Baie James, Quebec, Canada (J0Y 2X0)
Filed Jan. 26, 1979, Ser. No. 6,733
Int. Cl.³ G01B 3/18, 5/02
U.S. Cl. 33—166 **4 Claims**



1. A hand-held acoustic micrometer of the inside type for measuring the exact distance between two electrically-interconnected metallic objects, at least one of which is a flat surface, comprising:

(a) a micrometer head comprising a barrel having a closed outer end and a spindle telescopically and rotatably inserted through the other end of said barrel and protruding from said other end of said barrel, a stud protruding from said closed outer end of said barrel and forming an electrical contact adapted to engage the other one of said metallic objects when taking a measurement; a straight rod secured at one end to the protruding portion of said spindle and axially aligned with said stud;

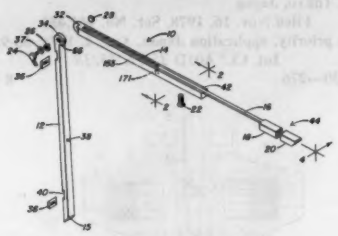
(b) a housing secured to the other end of said rod at its inner end and having a cavity opening at the outer end of said housing, a base plate secured to the outer end of said housing and closing said cavity of said housing, said base plate forming an outer flat surface perpendicular to the common axis of said stud end of said rod and adapted to physically engage said flat surface of said one metallic object, so as to maintain said axis perpendicular to said last-named flat surface, said base plate made of electric insulating material and having a cavity opening at its outer flat surface;

(c) a battery located in said housing cavity;

(d) a resilient electrical contact blade connected to one terminal of said battery and mounted within said cavity of said base plate and biased to take a free standing position in which it protrudes from said outer flat surface of said base plate, so as to bend inwardly and make good electrical contact with said one metallic object when said base plate physically engages said flat surface of said one metallic object; and

(e) a sound generator and speaker assembly removably connected between the other terminal of said battery and said stud and emitting a sound when the electrical circuit is completed between the metallic objects through said stud and through said contact blade.

4,223,445
CARPENTRY MEASURING TOOL
John L. Goodland, 7 Bradshaw St., Medford, Mass. 02155
Filed Mar. 23, 1979, Ser. No. 23,466
Int. Cl.³ E06B 3/00
U.S. Cl. 33—194 **5 Claims**



1. A measuring tool comprising:

a first member adapted for measuring distances between opposed surfaces, and including a captive slide formed as an extension thereof and extensible outwardly from a second end thereof in a direction away from a first end;

a second member secured at one end thereof to said first end of said first member, said second member being adapted to be pivoted within predetermined limits about said first end of said first member to form an angle with respect to said first member to thereby permit the measurement of angles formed by intersecting surfaces;

a beveled heel disposed on the distal end of said slide and being spring biased away from said first end, said beveled heel being momentarily retractable toward said first end a predetermined distance upon the longitudinal application of force thereto to permit disengagement of said beveled heel from one of said opposed surfaces;

tensioning means for urging surfaces on said first end against surfaces on said one end to prevent angular movement between said first member and said second member and to thereby permit the transfer of an angular measurement therebetween to a workpiece;

retaining means for securing said slide in a selected position to permit the transfer of a measurement of a distance by said first member to a workpiece;

means permitting said second member to be attached in a measuring position to one of said opposed surfaces;

a plurality of clips slidably disposed on a side of said second member substantially parallel to one of said opposed surfaces when said second member is in a measuring position, said clips being adapted to be slid parallel to said side and to project beyond said second member in such a manner as to permit desired alignment of said second member along said one edge of said workpiece, each of said clips being captured within a channel formed in said side of said second member, said channel having walls overlapping portions of said clips, each of said clips comprising:

a depression formed on surfaces of said clip confronting surfaces of said channel substantially parallel to said side and having a shape elongated substantially parallel to a direction in which said clips are adapted to be slid; and

a spring captured between said parallel surfaces of said channel and surfaces in said depression;

said spring being operable to urge said clip outwardly away from said side and against said overlapping walls, thereby preventing said clip from sliding without the application of a predetermined external force thereto; and

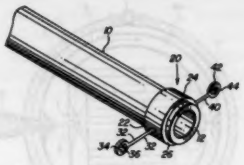
said spring and said depression cooperating to restrict the distance said clips are permitted to be slid to an amount equal to the elongated dimension of said depression.

4,223,446

LEAD SIGHT APPARATUS FOR SHOTGUNS

John N. Villa, 6942 W. Olive, Peoria, Ariz. 85345

Filed Jan. 22, 1979, Ser. No. 5,209
Int. Cl.³ F41G 1/00, 11/00
U.S. Cl. 33—261 2 Claims



1. Lead sight apparatus for securing to a shotgun barrel, comprising, in combination:

a barrel clamp for securing the apparatus to the barrel of a shotgun, including a bore for receiving the barrel substantially coaxial with the barrel of the shotgun;

a first arm and a second arm secured to the barrel clamp in axial alignment with each other on a diameter of the bore of the clamp for orientation on the shotgun barrel so as to be on the horizontal diametrical axis of the shotgun barrel;

first ring means secured to the first arm remote from the barrel clamp, and second ring means secured to the second arm remote from the barrel clamp, with the rings disposed diametrically relative to the arms and accordingly diametrically relative to the barrel of the shotgun; and

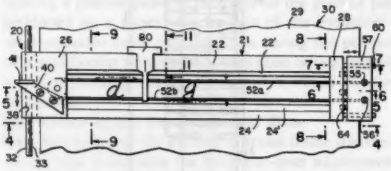
the length of the arms and the size of the rings being predetermined for the type of game being hunted, the gage of the shotgun, and the optimum distance of a shot to provide the proper lead by a user of the shotgun when sighting a shotgun when a ring is superimposed on the predetermined moving game.

4,223,447

WRITING GUIDE FOR CLIPBOARD OR THE LIKE

James C. Greenlees, 399 Asharoken Ave., Northport, N.Y. 11768

Filed Jul. 31, 1979, Ser. No. 62,301
Int. Cl.³ B43L 13/02
U.S. Cl. 33—443 9 Claims



1. A writing guide, comprising:

a rectangular, flat frame having coplanar, parallel upper and lower rails joined by end plates, and adapted to overlay a sheet on a baseboard;

a string means carried by said end plates and having two spaced string sections disposed between and parallel to said rails to define a space for writing a line on said sheet, said string means being flexible to yield laterally when contacted by a tip of a writing implement, to permit completion of a symbol being written on said sheet;

a flat block disposed adjacent one of said end plates and coplanar therewith;

attachment means engaging ends of said string sections with said block;

guide means extending between said flat block and said one end plate to hold said block in sliding engagement with respect to said frame; and

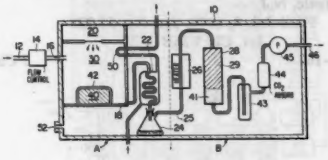
spring means extending between said flat block and said one end plate to permit said block to slide laterally against spring bias when either one of said string sections is flexed laterally.

4,223,448

DEHYDRATION AND INCINERATION OF SAMPLE MATERIAL

Tomo Saito, Sagamihara; Yumiko Nishiyama, Hatano; Kazuo Watanabe, Yokohama, and Naotake Morikawa, Tokyo, all of Japan, assignors to Sagami Chemical Research Center, Tokyo, Japan

Filed Oct. 7, 1977, Ser. No. 840,441
Claims priority, application Japan, Oct. 7, 1976, 51/119870; Aug. 4, 1977, 52/92961
Int. Cl.² F26B 3/30, 3/34
U.S. Cl. 34—4 27 Claims



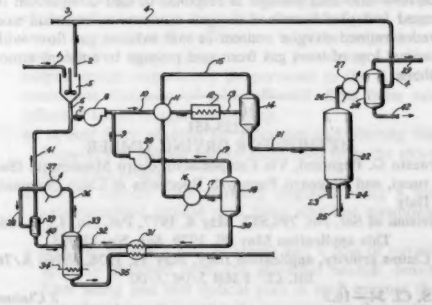
1. A dehydration method comprising the steps of disposing a sample to be dehydrated in a container having an inlet and an outlet and transmissive to microwaves, supplying air to said container at a suitable flow rate so that a substantially constant carrier air flow is established through said container to enhance the escape of water vapor from said container, and introducing a microwave electromagnetic field into said container so that water molecules in said sample are selectively excited to produce a gaseous mixture containing water.

4,223,449

HEAT-EFFICIENT METHOD FOR DEWATERING SOLIDS

William W. Bodle, Deerfield, and Dharamvir Punwani, Bolingbrook, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Jun. 27, 1979, Ser. No. 52,567
Int. Cl.³ F26B 3/00
U.S. Cl. 34—9 17 Claims



1. A process for treating a hydrocarbonaceous solid containing water to remove at least a portion of the water from the solid which comprises:

(i) contacting the water containing solid with a liquid solvent relatively free of moisture at an elevated temperature to transfer at least a portion of the water in the solid into

the solvent, said solvent characterized by its ability to dissolve only relatively small amounts of water at low temperatures and its ability to dissolve substantially greater amounts of water at higher temperatures;

(ii) removing at least a portion of the solvent containing water from the resultant solids at an elevated temperature to provide a solvent stream containing water and a product solid stream having a diminished water content;

(iii) cooling the solvent containing water stream to a lower temperature to cause the water to separate from the solvent and to provide a liquid solvent stream relativey free of water and a water stream relatively free of solvent; and,

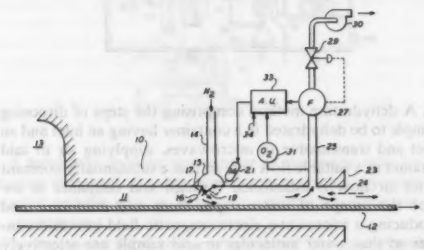
(iv) passing at least a portion of the liquid solvent stream relatively free of moisture to contacting step (i) to provide at least a portion of the liquid solvent utilized therein.

4,223,450

METHODS AND APPARATUS FOR CONTROLLING GAS FLOWS

Ronald D. Rothchild, South Orange, N.J., assignor to Airco, Inc., Montvale, N.J.

Filed Jul. 5, 1979, Ser. No. 55,226
Int. Cl.³ F26B *3/28*
U.S. Cl. 34—16 **7 Claims**



1. A method of inerting a passage having at least two interfaces in communication with ambient atmosphere comprising the steps of supplying inert gas at a substantially constant mass flow rate to said passage with a portion of said inert gas flow being directed to at least one of said interfaces; removing an exhaust gas flow at a predetermined flow rate from a location in the vicinity of said interface with said exhaust flow including inert gas discharged from the chamber and ambient atmosphere; sensing the oxygen content of said exhaust gas flow; comprising the sensed oxygen content with a predetermined oxygen content; and controlling the momentum of said inert gas flow into said passage in response to said comparison of sensed and predetermined oxygen contents to maintain said predetermined oxygen content in said exhaust gas flow with minimal loss of inert gas from said passage to ambient atmosphere.

4,223,451

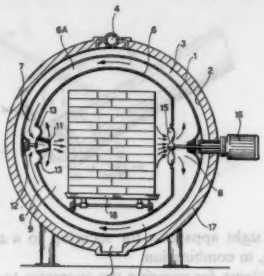
METHOD FOR DRYING TIMBER

Ernesto G. Pagnozzi, Via Camponuovo, Cairo Montenotte (Savona), and Vincenzo Pagnozzi, Rocchetta di Cairo (Savona), Italy

Division of Ser. No. 794,587, May 6, 1977, Pat. No. 4,176,466. This application May 30, 1979, Ser. No. 43,963
Claims priority, application Italy, May 12, 1976, 68164 A/76
Int. Cl.³ F26B *5/04, 3/00*
U.S. Cl. 34—16.5 **3 Claims**

1. A method for drying timber in a stack pervious to drying gas flow in a kiln including a drying chamber, heating means for heating said drying gas, nozzle means movably mounted in one side of said chamber for directing a jet of hot gas against a restricted region of a first side of said stack and periodically displacing said jet progressively over all regions of said first side of said stack and aspirating means for drawing said drying gas out of said chamber, comprising the following method steps:

(a) aspirating drying gas from substantially an entire second side of said stack opposite said first stack side,



(b) heating said aspirated drying gas externally of said drying chamber, and

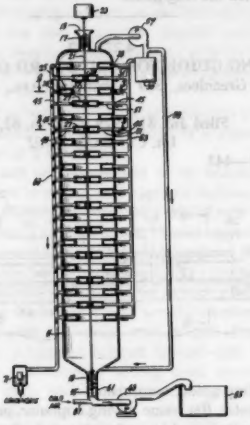
(c) recirculating said heated drying gas to said nozzle means in a closed circuit to provide the heated drying gas of said jet.

4,223,452

DRYING PROCESS AND APPARATUS FOR ACCOMPLISHING THE SAME

John M. Chambers, 541 Tremont Ave., Westfield, N.J. 07090

Filed Feb. 12, 1979, Ser. No. 11,564
Int. Cl.³ F26B *3/16*
U.S. Cl. 34—28 **16 Claims**



1. A process for drying wet solid material comprising introducing said wet solid material with the exclusion of air into a dryer at above atmospheric pressure, bringing said wet solid material into contact with the outside surfaces of a plurality of hollow plates located in said dryer, heated within by condensing recirculated vapor and vaporizing liquid contained in said wet solid material, withdrawing the vaporized liquid from the solid inlet end of said dryer and compressing said vaporized liquid to a pressure of at least from about 9 p.s.i.g. or more greater than the pressure in said dryer and returning he compressed vapor to the inside cavity of the said plurality of hollow plates in said dryer, condensing said compressed vapor

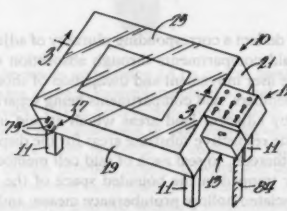
within the hollow plates and vaporizing liquid contained in wet solid material on the outside surfaces of said plurality of hollow plates with the latent heat of the condensing compressed vapors, and withdrawing the condensate from the inside of said plurality of hollow plates and substantially dried solids from said dryer.

4,223,453

TRAINING AID FOR REGISTERING MULTI-COLOR PRINTING

John H. Meyer, Madison, Conn., assignor to R. R. Donnelley & Sons Company, Chicago, Ill.

Filed Apr. 19, 1979, Ser. No. 31,322
Int. Cl.³ G09B *19/24*
U.S. Cl. 35—13 **28 Claims**



1. A training aid of the simulator type for teaching the registering of successive impressions in multi-color printing with a web press, said training aid comprising, in combination:

a base;

a plurality of generally concentric film supporting frames operatively associated with said base, an inner one of said frames being mounted for transverse, fore-and-aft and pivotal adjustments relative to the base;

a transparent film on each of said frames, each of said films bearing a precise positive facsimile of the printed pattern produced on a paper web by one of the cylinders of a multi-cylinder color printing press during the production of a multi-color printed web, said films occupying planes in a face abutting relationship which is effectively devoid of parallax;

a light source in said base below said films;

a first electric motor for moving said one frame transversely on the base to simulate the button-to-gear adjustment of a printing press cylinder;

a second electric motor for moving said one frame fore-and-aft on the base to simulate the circumferential adjustment of a printing press cylinder;

a control panel which effectively duplicates that on a multi-color printing press;

a plurality of control switches on said panel which are identical with those on a printing press control panel, each of said switches being in an energizing circuit for one of said motors to operate said one of said motors selectively in a forward or a reverse mode;

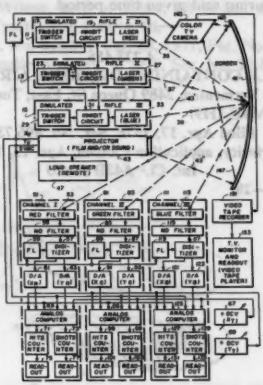
and a manual cocking control to simulate the cocking adjustment of a printing press cylinder, said cocking control being operatively connected to pivot said one frame about a pivot at one side of the frame and thereby move the film in the plane that it occupies.

4,223,454

MARKSMANSHIP TRAINING SYSTEM

Windell N. Mohon, Winter Park; Frank J. Oharek, Orlando; Robert J. Entwistle, Winter Park; David T. Long, Oviedo; John C. McKechnie, Maitland, and Don D. Doty, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 18, 1978, Ser. No. 943,601
Int. Cl.³ F41J *5/02*
U.S. Cl. 35—25 **26 Claims**



1. A marksmanship training system, comprising in combination:

means for receiving and reflecting radiant energy within a predetermined frequency range;

means spatially disposed from said radiant energy receiving and reflecting means for projecting a motion picture scene intermittently containing a predetermined target image thereon in such manner as to be reflected thereby, having a synchronization output;

means spatially disposed from said radiant energy receiving and reflecting means for firing shots of radiant energy having a predetermined frequency thereat and at the aforesaid reflected target image, comprising a pluraiity of simulated rifles, each of which is adapted for firing shots of radiant energy of a color different from that of the others;

means spatially disposed from said radiant energy receiving and reflecting means and connected to outputs of the aforesaid projecting means for receiving reflected images of the radiant energy shots fired at said reflected target image in coordinated synchronism with the projection of said reflected target image and for producing a pair of output signals respectively proportional to the X and Y coordinate distances of said reflected shots from said reflected target image, comprising;

an optical filter adapted for receiving and filtering that frequency of radiant energy shots fired from the aforesaid firing means;

a neutral density filter spatially disposed along a first predetermined optical path from said last mentioned filter;

a digitizer having a pair of inputs and a pair of outputs spatially disposed from the aforesaid neutral density filter along said first optical path in such manner that one of said inputs is optically responsive to that radiant energy received therefrom;

a frame lock connected between the synchronization output of the aforesaid projecting means and the remaining input of said digitizer;

a first digital-to-analog converter connected to one of the outputs of said digitizer; and

a second digital-to-analog converter connected to the other output of said digitizer;

means connected to the output of said last mentioned means for computing the number of times said radiant energy shots hit said reflected intermittent target image and the number of radiant energy shots fired per given period of time; and

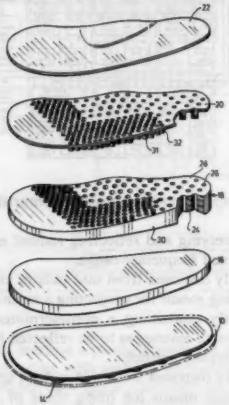
means connected to the outputs of said computing means for reading out the number of times said radiant energy shots hit said reflected target image and the number of shots fired during said given time period.

4,223,455

SHOE SOLE CONTAINING DISCRETE AIR-CHAMBERS

Jean-Pierre Vermeulen, 2489 Queen St. East, Toronto, Ontario, Canada (M4E 1H9)

Filed Apr. 17, 1978, Ser. No. 896,739
Claims priority, application Canada, Apr. 12, 1978, 301423
Int. Cl.[2] A43B *13/20*
U.S. Cl. 36—29 **14 Claims**



1. A sole for use in a shoe, said sole comprising:

(a) a base member;

(b) a mid-sole containing a plurality of discrete, vertically-aligned alveoli;

(c) an air-chamber member comprising a thin, resilient member adapted to seal said discrete, vertically-aligned alveoli thereby providing a plurality of discrete, vertically-aligned sealed air-chambers in said sole;

(d) an upper sealing member adapted to overlay said air-chamber member.

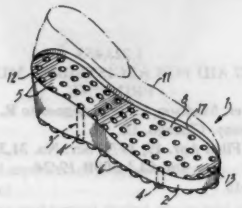
4,223,456

SHOE SOLE ASSEMBLY

Jacques Cohen, 2 Rue Marechal Harispe, Paris, France (75007)

Filed Jan. 5, 1979, Ser. No. 1,190
Int. Cl.[2] A43B *13/20, 7/08, 13/04*
U.S. Cl. 36—29 **6 Claims**

1. A shoe sole assembly of resilient material comprised of a body portion provided with energy absorbing means as part of said body portion, said assembly including: a plurality of vertically disposed closely spaced identical cell members extending respectively along the entire length of said body portion, said cell members are defined by a bounded space from an upper surface to beyond a lower surface of said body portion; each of said respective cell members having an elongated hollow compartment extending in part for the thickness of said body portion, the length of which depending upon sole profile; a first end of said respective compartments at the upper surface of said sole body portion being initially open ended; hollow protuberance means formed at the lower surface of said body portion enclosing each of said compartments at a second end, said protuberance means extending beyond the lower surface of said body portion to form contact areas with the ground surface when said sole assembly is used as part of a shoe; said protuberance means being hemispherically shaped, having a wall thickness which gradually diminishes from its base in proximity to the lower surface of said body portions to an upper most surface of said protuberance means, to allow said protuberance means to become actionable upon impringement at the lowest most surface with the ground, for urging corresponding inward deflection of respective protuberance means under stress, to thereby compress air within respective cell



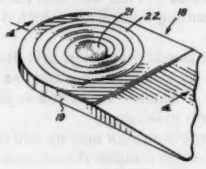
members and deflect a corresponding plurality of adjacent wall surfaces of said compartments through absorbtion of energy opposing shoe user movement and dissipation of shock energy by said cell members, said compartments being separated from one another by adjacent land areas which at said upper sole surface provide respective substrate areas for the disposition of an inner sole thereon, to seal each of said cell members with a volume of air trapped in the bounded space of the compartment and associated hollow protuberance means; and said sole upper surface being further defined by integrally formed flange means at the outer periphery thereof, for respectively positioning said inner sole and shoe upper upon said upper surface of said body portion.

4,223,457

HEEL SHOCK ABSORBER FOR FOOTWEAR

Alexander T. Borgeas, 129 W. Catalina Dr., Phoenix, Ariz. 85013

Filed Sep. 21, 1978, Ser. No. 944,264
Int. Cl.[2] A43B *21/28, 21/32*
U.S. Cl. 36—35 B **3 Claims**



1. An insert for covering the heel position of footwear comprising:

a pad portion,

said pad portion comprising a relatively flat heel engageable member having an aperture formed therein,

a resilient tubular member positioned in said aperture in said flat heel engageable member in a coiled configuration,

said tubular member comprises a hollow configuration filled with an elastomeric material and positioned in said aperture to be substantially flush with the surface of said heel engaging member,

a circular plug mounted in the center of said aperture having

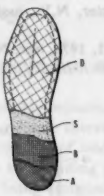
its heel engaging portion substantially flush with the heel engaging surface of said flat heel engageable member, and said tubular member being coiled around said circular plug, whereby when heelstrike of a user is applied to said tubular member, it momentarily distorts under the impact and returns to its initial position when the force is at least partially removed thereby serving as a shock and torque absorber.

4,223,458

LAMINATED SHOE INSOLE

Sueo Kihara, Habikino, Japan, assignor to Kihara Sangyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 30, 1979, Ser. No. 25,689
Claims priority, application Japan, Mar. 31, 1978, 53-36739
Int. Cl.[2] A43B *13/38*
U.S. Cl. 36—44 **5 Claims**



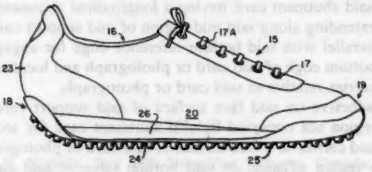
1. A shoe insole comprising (A) a coarse mesh-like woven cloth backing made of monofilaments of a vinylidene chloride-type polymer, (B) a honeycomb-woven cloth intermediate layer made of monofilaments of said vinylidene chloride-type polymer, (S) a sheet prepared by coating a latex containing activated carbon powder, copper powder and magnetic powder on a non-woven cloth made of staple fibers of said vinylidene chloride-type polymer and/or a vinyl chloride-type polymer and heat-treating the coated cloth, and (D) a fine-woven cloth surface layer made of monofilaments of said vinylidene chloride-type polymer, said cloths (A), (B), (S) and (D) being laminated in order and the peripheral edge of the laminate being welded.

4,223,459

ATHLETIC SHOE FOR RACING AND TRAINING

Donnie E. Riggs, 1606 Monteval Ct., San Jose, Calif. 95120

Filed Jul. 31, 1978, Ser. No. 929,647
Int. Cl.[2] A43B *5/00, 23/28*
U.S. Cl. 36—114 **3 Claims**



1. An athletic shoe for running on a running surface comprising in combination:

a shoe upper portion having heel, shank and toe areas and forming a cavity for receiving the foot;

a sole attached to said shoe upper portion for supporting the foot on a running surface, said sole comprising:

a cushioning pad of resilient material fixed to the upper portion and forming a bottom planar surface for contacting the running surface, said pad having side edges extending from the heel to the toe areas of the shoe upper portion; and

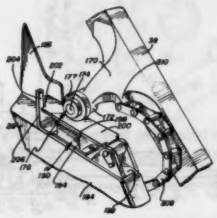
a plurality of resilient cleats having a truncated cone configuration fixed to the bottom surface of said cushioning pad and projecting therefrom to contact the running surface, at least a portion of said cleats tilting at an angle other than normal to said planar surface and towards the side edges of the pad thereby to facilitate compression of the cleats to increase the cushioning and stability of the foot during running.

4,223,460

ELEVATING SCRAPER UP-STOP MECHANISM

William J. Black, Wilmington; Warner G. Richardson, and Eugene M. Wilson, both of Joliet, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 816,831, Jul. 18, 1977, Pat. No. 4,159,583.
This application Feb. 8, 1979, Ser. No. 10,337
Int. Cl.[3] E07F *1/00*
U.S. Cl. 37—8 **5 Claims**



1. A scraper having a bowl with a cutting blade at the forward end thereof, an elevator having a frame, a linkage assembly, means for pivotally mounting said linkage assembly about a fixed pivot on the inside of said bowl, said linkage assembly having legs which are connected to said frame at two spaced points such that the lower portion of the elevator moves upward and forward relative to said blade, stop means fixed on the inside of the bowl for limiting upward and downward movement of said elevator, bracket means fixedly mounted on the frame of the elevator and projecting laterally outwardly therefrom, means on said bracket having one portion in contact with one of said fixed stop means for limiting downward movement of the elevator, means movable with said bracket means coacting with the other of said fixed stop means for limiting upward movement of the elevator, said means movable with said bracket means comprises a member pivotally mounted on said bowl in alignment with the other of said fixed stop means, and a chain connecting said member to said frame whereby excessive upward movement of the frame will move the member into contact with said other of said fixed stop means.

4,223,461

SLOPEBOARD MOUNTING

Coy C. Tackitt, Crestline, Calif. 92325

Filed Oct. 2, 1978, Ser. No. 947,727
Int. Cl.[3] E02F *3/76*
U.S. Cl. 37—105 **9 Claims**

1. In an earth moving vehicle having a main bulldozer blade carried by a vehicle frame, the improvement comprising:

a slopeboard disposed in cantilevered fashion to one side of said main bulldozer blade and constructed with a forwardly opening trough shaped panel reinforced from the rear by a generally triangular channel that narrows near a cantilevered end thereof,

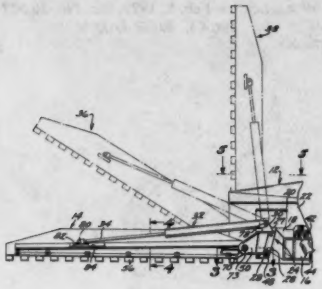
a transverse mounting beam secured across the front of said vehicle frame and attached to the back side of said main bulldozer blade at transversely separated rigid connections,

a reinforcing gusset plate fastened to the back side of said main bulldozer blade at at least one of said mounting beam connections,

a slopeboard support connected to and extending rear-

wardly and outwardly from said gusset plate relative to said vehicle frame,

a horizontal mounting connection which includes a reinforcing anchor fastened to the back side of said main bulldozer blade outwardly from said reinforcing gusset plate, relative to said vehicle frame, an axle rod rigidly secured to said anchor and extending rearwardly therefrom and rigidly secured to a rearward and outward extremity of said slopeboard support, a sleeve secured to said slopeboard and disposed about said axle rod, and bushings interposed between said sleeve and said axle rod at opposite ends thereof,



an actuating hinge connection located on said slopeboard support and inwardly relative to said vehicle frame from said horizontal mounting connection and parallel thereto, and

a pressurized fluid actuating cylinder rotatably connected both to said actuating hinge connection and to said slopeboard at an attachment remote from said actuating hinge connection,

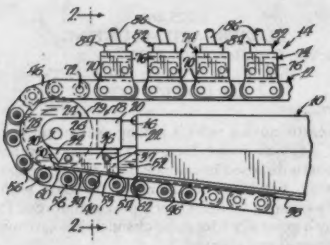
whereby said slopeboard is rotatably connected to said horizontal mounting connection to thereby rotate thereabout to a selected disposition relative to said main bulldozer blade.

4,223,462

DIGGING CHAIN SUPPORT FOR EXCAVATION

Marvin L. Morris, Wichita, Kans., assignor to J. I. Case Company, Racine, Wis.

Filed Apr. 26, 1979, Ser. No. 33,454
Int. Cl.[3] E02F *3/14*
U.S. Cl. 37—191 A **5 Claims**



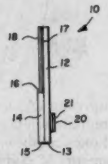
1. Excavating apparatus comprising: a boom adapted to carry a digging chain, the boom having an upper surface, a lower surface, an inner end and an outer end, the upper surface and lower surface adapted to slidably engage the chain, the digging chain including links connected by pins which support rollers, the links having inner surfaces adapted to slidably engage at least one of said upper and lower surfaces of the boom; an idler pulley having a circumferential surface rotatably mounted on the outer portion of the boom, the circumferential surface of the idler pulley adapted to engage the chain; skid shoe means disposed between the idler pulley and the outer end of the boom for slidably engaging and supporting the links of the chain between the idler pulley and the lower surface of the boom, the skid shoe means defining a support surface that is substantially coplanar with the lower surface of the boom; a nose piece mounted on the outer end of the boom, the nose piece having a lower surface generally parallel to the lower surface of the boom and adapted to engage the digging chain rollers when the links of the chain are engaging the skid shoe means.

4,223,463

RECORDING TAPE CARRIER

David M. Good, Rochester, N.Y., assignor to Tapecon, Inc., Rochester, N.Y.

Filed Sep. 11, 1978, Ser. No. 940,885
Int. Cl.[2] G09F *1/10, 27/00*; G09B *5/04*
U.S. Cl. 40—158 R **10 Claims**



1. A magnetic recording tape carrier attachable to a card or photograph and usable in a recording slot of a magnetic recorder both before and after attachment to a card or photograph, said carrier comprising:

a. a plane support card rectangular in cross section and having a bottom edge formed as a linear reference edge for guiding said carrier in moving through said recording slot;

b. a plane abutment card rectangular in cross section and secured to a face surface of said support card adjacent to said bottom reference edge to form an assembly;

c. said abutment card extending from the region of said bottom reference edge of said support card vertically upward to a mid-region of said support card to cover a lower region of said support card;

d. said abutment card having a longitudinal abutment edge extending along said mid-region of said support card and parallel with said bottom reference edge for engaging a bottom edge of said card or photograph and locating said carrier relative to said card or photograph;

e. adhesive on said face surface of said support card in a region not occupied by said abutment card for securing said carrier to a face surface of said card or photograph in a region adjacent to said bottom edge of said card or photograph;

f. a release sheet covering said adhesive;

g. a strip of magnetic recording tape secured to said assembly between said reference edge and said abutment edge to extend parallel with said reference edge and have a predetermined spacing from said reference edge, said magnetic recording tape being disposed below said bottom edge of said card or photograph when said carrier is attached to said card or said photograph; and

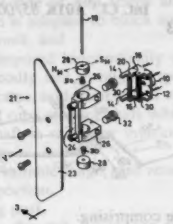
h. said release sheet being removable for securing said assembly to said card or photograph by means of said adhesive with said abutment edge engaging said bottom edge of said card or photograph.

4,223,464

DISPLAY OR INDICATOR ELEMENT

Donald Winrow, Weston, Canada, assignor to Ferranti-Packard Limited, Mississauga, Canada

Filed Mar. 22, 1979, Ser. No. 22,790
Int. Cl.[2] G09F 9/37
U.S. Cl. 40—449 7 Claims



1. Display or indicating element including:
a base,
a display element rotatably mounted thereon to rotate about an axis of rotation relative thereto,
means limiting the rotation of said display element to less than 180° between two limiting positions,
said display element being designed to create mutually contrasting effects, in a viewing direction, in said two limiting positions,
a pair of reversible permanently magnetizable magnetic elements,
each extending between first and second free ends,
an electrical energizing coil corresponding to each magnetizable element for magnetizing the latter,
said two first free ends defining a first gap between them, having a substantial component transverse to the axis of rotation,
said two second ends defining a second gap between them, having a substantial component transverse to the axis of rotation,
first and second permanent magnets mounted on and rotatable with said display element,
each of said first and second magnets being located and oriented so that for either, opposite magnetization of said magnetizable elements the flux across said gap will exert torque in one sense on the corresponding magnet on rotation of said magnet over said range of movement and so that said torque will be in the same sense for both magnets.

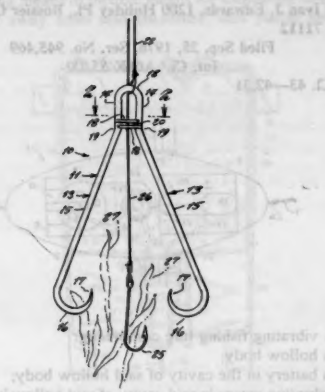
4,223,465

LURE RETRIEVER

John E. Nichols, Box 148, Vermilion, Alberta, Canada (T0B 4M0)

Filed Jan. 8, 1979, Ser. No. 1,855
Int. Cl.[3] A01K 97/00
U.S. Cl. 43—17.2 1 Claim

1. An improved lure retriever, comprising, in combination, a metal wire member bent at its center, so as to form two legs, each of which, at its end, is bent into a hook, said hooks facing each other, and a fishing line guide formed on said member, comprising a pair of axially spaced-apart, semi-circular plates, each having a semi-circular notch, which, together, form a circular opening for receiving said fishing line of a snagged hook, and said member being attached to a retriever line; each said semi-circular plate being affixed on one said leg, a rolled-up coil spring urging said legs apart, said legs being held forcibly together by a U-shaped clip attached to a pull line, said U-shaped clip including a pair of parallel legs, each of which is inserted in a hole in each said plate.

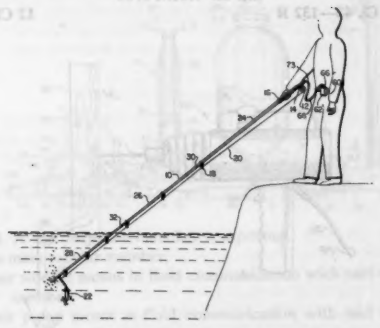


4,223,466

FISHING APPARATUS

Johnnie L. King, Rte. 1, Box 320, Wagarville, Ala. 36585

Filed Jan. 23, 1979, Ser. No. 5,869
Int. Cl.[3] A01K 87/00
U.S. Cl. 43—18 R 11 Claims



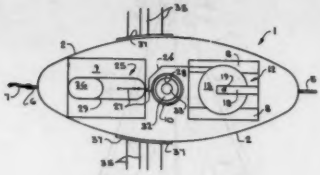
1. A fishing apparatus comprising;
a pole;
means for delivering a flow of air under pressure to the distal end of said pole; and
perforated aeration means associated with said pole in fluid communication with said delivery means and including a plurality of perforations; whereby when said aeration means is placed under the surface of the body of water in which the fishing apparatus is being used, a stream of bubbles emanates from said aeration means to create a diversion for attracting a fish.

4,223,467

VIBRATING FISHING LURE

Jesse L. Hodges, Jr., Rt. 1, Box 215, Elm Groove, La. 71051, and Ivan J. Edwards, 1200 Holiday Pl., Bossier City, both of La. 71112

Filed Sep. 25, 1978, Ser. No. 945,469
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.31 **2 Claims**



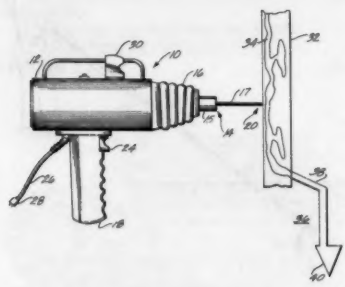
1. A vibrating fishing lure comprising:
(a) a hollow body;
(b) a battery in the cavity of said hollow body;
(c) vibrating means in said cavity of said hollow body and in electrical cooperation with said battery;
(d) attitude sensitive switch means in said cavity of said hollow body and in electrical cooperation with said battery and said vibrating means for selectively energizing said vibrating means responsive to tensioning of a fishing line connected to said body;
(e) a plurality of thin, flexible, outwardly extending finger means projecting from said body and vibrating with said vibrating means to disturb the water supporting and surrounding said lure; and
(f) eye means carried by said hollow body for attaching said line and at least one hook to said lure.

4,223,468

METHOD AND APPARATUS FOR TERMITE CONTROL

Lucas G. Lawrence, 2710 N. State St., San Bernardino, Calif. 92405

Filed May 5, 1978, Ser. No. 902,949
Int. Cl.² A01M *3/00*
U.S. Cl. 43—132 R **12 Claims**



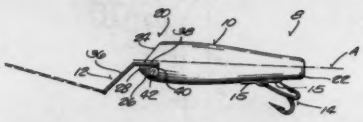
1. An apparatus for applying electrical energy to termite infested structures comprising:
a portable housing;
a source of electrical energy;
electric current means connected to the energy source for generating high voltage radio frequency electrical energy pulses;
an output electrode connected to the radio frequency generating means extending from the housing; and
structure contacting means on the output electrode for establishing physical contact with the termite infested structure to deliver high voltage radio frequency energy pulses by electrical conduction to said infested structure.

4,223,469

FISHING LURE

Robert J. Luz, 5006 N. Larkin St., Whitefish Bay, Wis. 53217

Filed Aug. 14, 1978, Ser. No. 933,151
Int. Cl.³ A01K *85/00*
U.S. Cl. 43—42.03 **3 Claims**



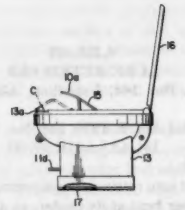
1. A fishing lure comprising:
a body member having a longitudinal axis and a nose portion and a tail portion, said nose portion comprising upper and lower flat surfaces which intersect along a straight line at the front most edge of the nose portion, said upper surface being larger than said lower surface;
a hook fastened to the underside of said body member;
a flap member pivotally connected to the nose portion of said body member, said flap member comprising a flat bill portion extending forwardly from said nose portion of said body member and a pair of flat arm portions extending from the side edges of said bill portion towards said nose portion of said body portion, said flap member further including connector means for pivotally connecting said arm portions to said nose portion of said body member, said bill portion having an attachment means therein located adjacent the leading edge thereof to facilitate attachment of the lure to a fishing line, said pivotal connector means between said arm portions of said flap member and said nose portion of said body member being located below the longitudinal axis of said body member, said flap member being further characterized by having an included angle between the plane of said bill portion and the plane of said arm portions of 135°.

4,223,470

SAVINGS BOX TOY WITH LOCKING LID FOR SAFETY

Hiroichi Yonezawa, Matsudo, Japan, assignor to Kabushiki Kaisha Yoneya Gangu, Tokyo, Japan

Filed Jun. 23, 1978, Ser. No. 918,509
Claims priority, application Japan, Dec. 14, 1977, 52/167582[U]
Int. Cl.³ A63H *33/00*
U.S. Cl. 46—5 **1 Claim**



1. A savings box toy comprising an operating body and a vessel body,
said operating body including:
a frame,
a gear interlocking mechanism having a spiral spring as a motive power,

a gear shaft in said gear interlocking mechanism, said gear shaft serving as an output shaft and being projected exteriorly of said frame,

a crank attached to said gear shaft,

an inverted L-shaped operating rod the lower end of which is pivotally attached to said crank,

an operating lever mounted pivotally and through a spring on one side of said frame and having a nose portion which is adapted to block and release the motion of said crank, and

a stopper rod disposed longitudinally of said frame and mounted pivotally and through a spring on the other side of said frame, said stopper rod engaging a stopper cam mounted on a stopper shaft which consists of another gear shaft in said gear interlocking mechanism; and

a vessel body of a suitable shape, said vessel body including:

a coin placing portion,

a coin throwing port,

a through hole through which the upper part of said operating rod is projected to allow the latter to move freely, said coin placing portion, coin throwing port and through hole being formed on one side of the upper face of said vessel body,

an inner cover mounted pivotally and through a spring on the other side of said upper face, said inner cover covering said coin throwing port and said through hole, and

an outer cover pivotally mounted for opening and closing on the upper face of said inner cover, said outer cover having a rear end portion on which is formed a lug associated with the upper end of said stopper rod,

the nose side of said operating rod being projected from the through hole in the lower face of said inner cover toward said coin placing portion, the nose portion of said stopper rod being associated with said lug formed at the rear end of said outer cover and the rear end side of said operating lever being projected and fixed to the exterior of the vessel body, whereby upon opening of said outer cover, the lug thereof pushes the nose portion of said stopper rod, thus causing the lower end portion of said stopper rod to move out of engagement with said stopper cam, so that if the operating lever is pushed in this state, the crank which has been blocked in its rotation by engagement with the nose portion of said operating lever is released and rotates, resulting in that the nose portion of said operating rod is pivoted to said crank, forces said inner cover up and open, reciprocates on said coin placing portion and throws the coin thereon into said coin throwing port.

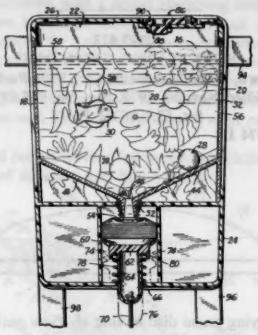
4,223,471

AQUARIUM CRIB TOY

Sheldon Greenberg, Fort Lee, N.J., assignor to Shelcore, Inc., New York, N.Y.

Filed Dec. 13, 1978, Ser. No. 969,285
Int. Cl.[3] A63H *29/10*
U.S. Cl. 46—41 **9 Claims**

1. An amusement device comprising a transparent enclosure for containing a liquid, at least one movable object within said enclosure, the density of said object being greater than the density of said liquid, a flexible resilient bellows, said bellows depending from said enclosure, means for transmitting said liquid between said enclosure and said bellows, means to manually expand said bellows, so that a body of said liquid is drawn from said enclosure into said bellows, compressing spring means, said spring means depending from said bellows and having a lower fixed mounting, so that when said bellows is manually expanded, said spring means is compressed against said lower fixed mounting and urges said bellows to an idle contracted shape, whereby liquid is expelled from said bellows into said enclosure, when said manual means to expand said bellows is released, and a movable piston, one end of said bellows being mounted to the head of said movable piston, so that said movable piston coaxially depends from said bellows, said spring means being concentrically disposed about the rod of said movable piston and extending between the head of said movable piston and said lower fixed mounting, said rod slidably extending through an opening in said lower fixed mounting of said spring means to flexible means for displacing said movable piston away from said enclosure, said piston and said



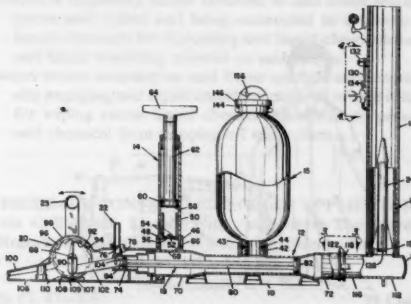
flexible displacement means constituting said means to manually expand said bellows, the head of said movable piston being of greater dimension than the opening in said lower fixed mounting of said spring means.

4,223,472

TOY PROJECTILE LAUNCHING DEVICE

Ferenc Fekete, Huntington Beach; Wayne R. Halford, Manhattan Beach, both of Calif., and Michael O. Hirtle, East Aurora, N.Y., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Apr. 24, 1978, Ser. No. 899,374
Int. Cl.[3] A63H *29/16*
U.S. Cl. 46—44 **14 Claims**



1. A toy projectile launcher comprising:

a main tubular member;

air storage means in fluid communication with said tubular member;

air pump means in fluid communication with said tubular member;

projectile launching means in fluid communication with said tubular member;

manually operable valve means having an elongated bar with first and second enlarged end of generally circular configuration in sealing sliding engagement with said main tubular member, said valve means being operable through first, second and third position; and

air-operated sounding means in fluid communication with said tubular member adjacent to first end of said elongated bar, said valve means when in said first position enabling air to pass from said air pump means to said air storage means, when in said second position enabling air from said

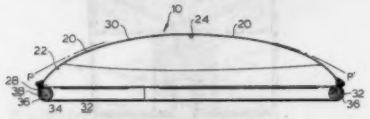
air storage means to pass to said projectile launching means whereby to launch a toy projectile therein in response to movement of said air, and when in said third position permitting air to pass through said air-operated sounding means.

4,223,473

SOFT FLYING GAME DISC

James L. Brown, 18552 Mendocino Cir., Villa Park, Calif. 92667

Filed Nov. 30, 1978, Ser. No. 965,077
Int. Cl.³ A63H *33/18*
U.S. Cl. 46—74 D **20 Claims**



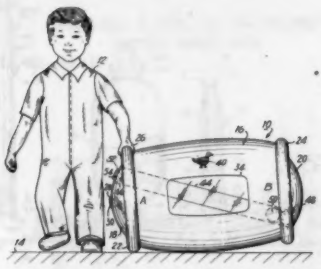
1. A soft flying game disc having air flow path determined lift and flight stability characteristics, said disc comprising a limp, generally circular fabric, and means defining a stiffened annular locus extending circularly and inward of the fabric peripheral edge margin to form a central air foil structure circumscribed by said means and peripheral spoiler skirt structure radially beyond said means, whereby said air flow path is increased and lift and flight stability characteristics of the disc correspondingly enhanced.

4,223,474

INFLATABLE NURSERY TOY

Manfred Strauss, Randolph, N.J., assignor to Shelcore, Inc., New York, N.Y.

Filed May 21, 1979, Ser. No. 40,498
Int. Cl.³ A63H *3/06*
U.S. Cl. 46—87 **15 Claims**



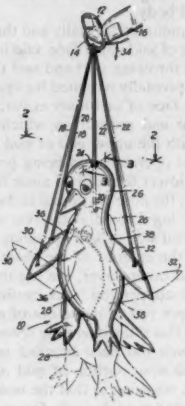
1. An inflatable nursery toy comprising shaped inner and outer inflatable bags composed of soft, limp, flexible, non-resilent sheet material, said inner bag being within said outer bag, said inner bag being elongated and having two opposite ends, said inner bag extending from a first inner attachment at one end to a wall of said outer bag, to a second inner attachment at the opposite end to a wall of said outer bag, at least one discrete solid member, said member being disposed within said inner bag so that said member is displaceable by gravity along the length of said inner bag, said outer bag having an opening in a wall thereof to enable the outer bag of the toy to have air under mild pressure introduced into the interior thereof, means to selectively close said opening in the wall of the outer bag in order to selectively retain air in the outer bag and thereby keep the toy inflated, said inflated toy having a configuration and dimensions such that when the toy is on a level horizontal surface, the top thereof is at approximately the level of the height of a hand of a small child learning to walk, said inflated toy having a curved surface so that said inflated toy may be rolled by a small child over a level horizontal surface, said inner bag having an opening in a wall thereof at said first and/or second inner attachment to a wall of said outer bag, to enable the inner bag of the toy to have air under mild pressure introduced into the interior thereof so that said inner bag assumes an elongated shape, and means to selectively close said opening in the wall of the inner bag in order to selectively retain air in the inner bag and thereby permit motion of said discrete solid member along the axis of said elongated inner bag when the toy is manipulated by said rolling by a small child over a level horizontal surface.

4,223,475

MARIONETTE WITH STRINGS WITH DIFFERENT DEGREES OF ELASTICITY

Isaac Hills, c/o Rincon Mfg. Co. Inc., 168 39th St., Brooklyn, N.Y. 11232

Filed Mar. 14, 1979, Ser. No. 20,623
Int. Cl.² A63H *7/00*
U.S. Cl. 46—126 **8 Claims**



1. A marionette with differential movement which comprises a body, an upper member mounted to said body, at least one limb extending from said body and articulatably connected thereto, a first flexible elastic manipultion string, said first string extending from said upper member so that when under tension and extended, said first string assumes a rectilinear form aligned proximately with the center of gravity of said body, and a second flexible elastic manipulation string, said second string extending from said limb to means common to both said first string and said second string for placing said strings under tension and in an extended rectilinear form, said first string having a different degree of elasticity than said second string, so that when said common means is manipulated, said limb is differentially displaced relative to said body.

4,223,476

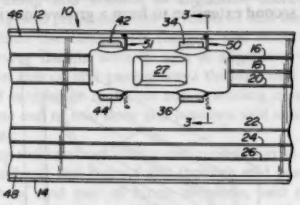
BLOCKING TOY VEHICLE

Ronald W. Meyer, Cinnaminson, N.J., and Robert A. Jackman, Weston, Conn., assignors to Tyco Industries, Inc., Moorestown, N.J.

Filed Oct. 24, 1978, Ser. No. 954,143
Int. Cl.³ A63H *18/12*
U.S. Cl. 46—257 **8 Claims**

1. A toy vehicle comprising a body mounted on wheels, motor means cn said body drivingly coupled to a pair of said wheels for propelling the body along a track, first and second guide means projecting laterally with respect to said body at spaced locations for cooperating with a groove in a track so

that the body will be propelled by said pair of wheels parallel to the groove, each guide means terminating in a free end portion projecting downwardly for entry into a groove, each guide means including a guide pin, each guide pin having a



pivot portion at an end thereof opposite said free end portion, the free end portion and the pivot portion being interconnected by a horizontally disposed portion embraced by said body, the horizontally disposed portion being parallel to the axis of rotation of said pair of wheels.

4,223,477

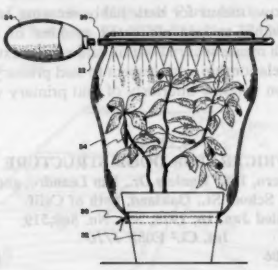
HOUSE PLANT SPRAYER SHROUD

James A. Abernathy, 216 Park Ave., Monterey, Calif. 93940

Filed Jun. 16, 1978, Ser. No. 916,232

Int. Cl.³ B05B *1/28*

U.S. Cl. 47—1 R **4 Claims**



1. A spraying assembly for potted plants comprising

a flexible plastic bag formed at one end with an opening,

a tubular member extending into the bag at a distance from said opening, said tubular member having a closed end and an open end, with a plurality of outlet openings in said tubular member located so as to be within the confines of the bag in the operating position of the assembly,

syringe means adapted for attachment to the open end of the tubular member, and

means for detachably fixing the opening of the bag about the external sides of an upright flower pot so that the tubular member in the bag extends above the flower pot, such that fluid material in said syringe, when the syringe is attached to the tubular member, may be ejected through the outlet openings of the tubular member into the interior of the bag to spray a plant in a flower pot, about the external sides of which, the bag is detachably fixed, with the wall of the bag serving to confine the said fluid material within the interior of the bag.

4,223,478

AGRICULTURAL CHEMICAL APPLICATOR

Dennis P. McHugh, Box 429, Sioux Rapids, Iowa 50585

Filed May 4, 1979, Ser. No. 36,389

Int. Cl.³ B05C *1/00*

U.S. Cl. 47—1.5 **8 Claims**

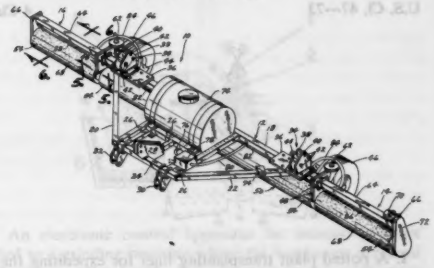
1. An agricultural chemical applicator comprising:

a roller frame assembly having at least first and second elongated frame sections;

each of said frame sections having an elongated roller rotatably journaled therein for rotational movement about a rotational axis, said roller having an outer cylindrical surface covered with a liquid absorbing material;

hinge means interconnecting said first and second roller frame sections for articulated swinging movement from a straight position wherein said rotational axes of said rollers of said first and second frame sections are in approximate registered alignment to a folded position wherein said rotational axes are articulated with respect to one another;

each of said rollers having lug means connected thereto and positioned adjacent said hinge means;



said lug means of said roller of said first frame section being positioned to engage said lug means of said roller of said second frame section when said frame sections are in said straight position whereby rotational movement of one of said rollers will be transmitted to the other of said rollers;

power means connected to said one roller for rotating said one roller;

chemical dispensing means mounted to said frame sections above said rollers and being connected to a source of liquid chemicals for dispensing said liquid chemicals onto said liquid absorbing material on said rollers;

wiper means mounted on said frame sections and functionally engaging said liquid absorbing material of said rollers for wiping excess liquid chemical therefrom to prevent said chemical from dripping off said rollers.

4,223,479

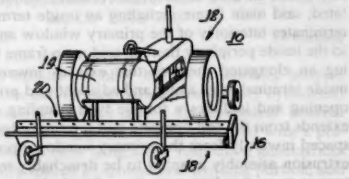
FEEDBACK CONTROLLED ROLLER APPLICATOR

Orvin C. Burnside, Lincoln, Nebr., assignor to The Board of Regents of the University of Nebraska, Lincoln, Nebr.

Filed Jul. 10, 1979, Ser. No. 56,334

Int. Cl.³ B05C *1/00*

U.S. Cl. 47—1.5 **29 Claims**



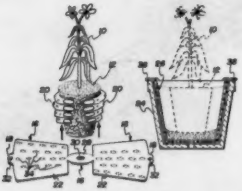
1. A method of selectively applying fluids to plants, comprising the steps of:

adjusting a member at a location above first plants and at an elevation lower than the tops of second plants;

moistening said member with said fluid;

moving said member above said first plants so that it contacts an upper portion of said second plants;
moistening said member with said fluid to be applied to said second plants;
controlling the amount of moisture on said member; and
said step of controlling the amount of moisture including the step of measuring the moisture on said member and applying fluid to maintain said moisture within a predetermined range.

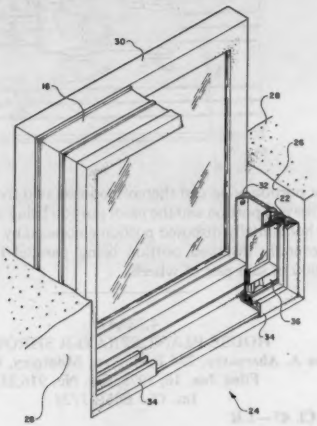
4,223,480
POTTED PLANT TRANSPLANT LINER
Gary A. Welty, 10144 Del Rio Rd., Spring Valley, Calif. 92078
Filed Nov. 1, 1978, Ser. No. 956,617
Int. Cl.[3] A01G *9/02*
U.S. Cl. 47—73 **4 Claims**



1. A potted plant transplanting liner for expediting the removal of a plant together with its root mass from a plant pot, said liner comprising:
(a) a unitary planar flexible sheet defining a generally circular central portion and a pair of oppositely-directed radially extended generally fan-shaped portions extending from opposite sides of said central portion;
(b) a pair of tabs defined respectively by the outer edges of said radially extended portions;
(c) whereby when said liner is nested in a plant pot it conforms substantially to the interior surface thereof and when said plant requires transplanting said sheet can be drawn fee of said pot by lifting same by said tabs, placing same on a horizontal surface, peeling said radially extended portions free of said root mass, and lifting said plant free of said generally circular central portion.

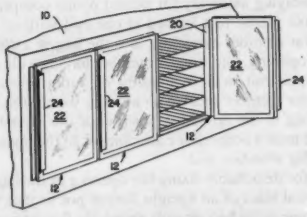
4,223,481
STORM WINDOW
Edward J. Page, Hampton, Va.
Continuation of Ser. No. 798,593, May 19, 1977, abandoned.
This application Dec. 12, 1978, Ser. No. 968,767
Int. Cl.[3] E05C *7/02*
U.S. Cl. 49—63 **8 Claims**

1. An improved storm window for use in conjunction with a primary window disposed within a window opening of a building, comprising: a main frame disposed interiorly of and generally about an area adjacent the primary window to be insulated, said main frame including an inside terminal edge that terminates interiorly of the primary window and which abuts to the inside periphery thereof; said main frame further including an elongated member that extends inwardly from said inside terminal edge along and adjacent said primary window opening and includes a tongue type coupling extension that extends from the end opposite said terminal edge and which is spaced inwardly from the primary window opening; a runner extrusion assembly adapted to be detachably mounted to the tongue type coupling extension of said elongated member of said main frame, said runner extrusion assembly including a tongue receiving opening for receiving said tongue type coupling extension of said elongated member of said main frame and wherein said tongue receiving opening is formed by first and second extensions that form a part of said runner extrusion assembly, said first extension extending between said primary window opening and said elongated member of said main frame and said second extension extending adjacent the inside of said elongated member of said main frame on the side opposite said first extension; said runner extrusion assembly further including at least two runner extrusions extending inwardly from said second extension to form a groove interiorly of said



primary window; means for detachably securing said runner extrusion assembly to said elongated member of said main frame; and sash means secured within said runner extrusions in spaced apart relationship with respect to said primary window to form a storm window interiorly of said primary window.

4,223,482
REFRIGERATOR DOOR STRUCTURE
Louis F. Barroero, 1585 Daniels Dr., San Leandro, and Socrates Dekas, 2631 School St., Oakland, both of Calif.
Filed Jan. 16, 1978, Ser. No. 869,519
Int. Cl.[2] E05F *1/10*
U.S. Cl. 49—386 **16 Claims**



1. A refrigerator door structure for selectively closing a rectangular opening through the wall of a refrigerated compartment bounded by substantially horizontal upper and lower structural members spaced from each other a given vertical distance, said refrigerator door structure comprising:
a. a mullion having a length slightly less than said given vertical distance and mounting means at each of its ends for rigidly fixing said ends of said mullion to said upper and lower structural members with said mullion in a substantially vertical position within said opening;
b. a pair of rigid hinge members fixed to said mullion and projecting therefrom outwardly of said refrigerator compartment and transversely of the plane defined by said upper and lower structural members, said hinge members being spaced from each other along said mullion and the projecting end portion of each thereof having a passage-

way formed therethrough along a common axis parallel to said mullion;

c. a rectangular door having sides of greater length than said given vertical distance with one side extending overlappingly along said mullion in alignment therewith and receiving said projecting end portions of said hinge members within the boundaries thereof, said door having a passageway therein with its axis in alignment with said common axis of said passageways through said end portions of said hinge members and extending continuously from one end of said door and between said spaced hinge members;

d. a torsion rod received within said passageway in said door from said one end thereof and through said passageways of both of said pair of hinge members, said rod being rotatably received in said passageway in said door and said passageway of the one of said pair of hinge members adjacent said one end of said door, said rod being fixedly received against rotation in said passageway of the other of said pair of hinge members; and

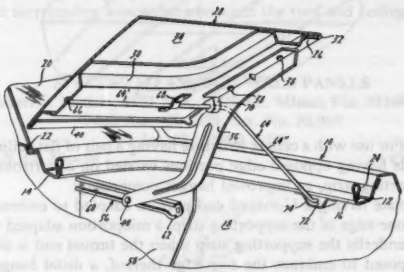
e. locking means at said one end of said door locking the adjacent portion of said torsion rod against rotation with respect to said door when said torsion rod is received within said passageway in said door and through said passageways of both of said pair of hinge members.

4,223,483

CLOSURE HINGE MECHANISM

Douglas J. Stafford, Grosse Pointe Woods, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 23, 1979, Ser. No. 23,127
Int. Cl.[2] E05F *1/10*
U.S. Cl. 49—386 **5 Claims**



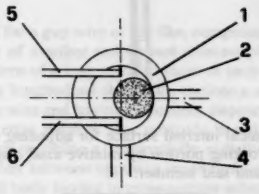
1. A combination hinge mechanism and opener for a closure adapted to pivot between open and closed operative modes with respect to an opening in a vehicle body comprising: hinge arms attached at first end portions to the closure and extending therefrom through the vehicle opening and beneath one edge portion thereof; a pair of tracks supported beneath the one edge portion and extending in a generally horizontal orientation; one track follower on each other end portion of the hinge arms engaging a respective track and providing a moving pivot for the closure; torsion bar means between the closure and the vehicle to provide an opening force on the closure and to provide a second pivot for imparting an upwardly bodily shifting motion to the closure in cooperative relation with the track follower as it moves beneath the one edge portion; the torsion bar means including an elongated portion and a radially extending crankarm portion, the end of the elongated portion being fixedly supported in a non-rotative manner to permit twisting and untwisting of the elongated portion as the closure is respectively closed and opened, the end of the crankarm portion being rotatively supported so that as the closure moves between closed and open operative modes the hinged closure edge is bodily shifted away from the one edge portion as the hinge arm enclosure pivot about the torsion bar simultaneously with lineal movement of the track follower in the track.

4,223,484

ELECTRONIC CONTROL DEVICE FOR GRINDING MACHINES, BASED ON THE EVALUATION OF TRUING DIAMOND POSITION RELATIVE TO WORKPIECE

Vittorio Giardino, Strada Maggiore 32, Bologna, Italy, and Loris Giardino, Via G. Rossi, 4, Bologna, Italy

Continuation-in-part of Ser. No. 771,972, Feb. 25, 1977, abandoned. This application Nov. 7, 1978, Ser. No. 958,436
Claims priority, application Italy, Oct. 1, 1976, 3549 A/76
Int. Cl.[3] B24B *49/04*
U.S. Cl. 51—165.77 **6 Claims**



1. An electronic control apparatus for internal grinders applied to a grinding machine where the workpiece is placed on slippers, and fitted with a hole diameter gauger, of the type in which the positions of both ends of a diameter are separately sensed by two symmetric, linear transducers, and with a measuring instrument acting along the axis of wheelhead unit traverses, referred to a trued position, the apparatus comprising means for deriving displacements from one workpiece to the next workpiece of the axis of rotation, caused by differences in their respective outer diameters from signals from said two linear transducers, said means for deriving comprising an analogic inverter, wherein the sign of the signal delivered by one of said transducers is reversed, an analogic adder wherein the sum is formed of said signal having a reversed sign and of the signal delivered by the other one of said transducers; means for obtaining from the hole diameter gaugings, from the traverses of grinding wheel and from the displacements of workpiece rotation axis, the trued position considered along the axis of feeds relative to a workpiece, and means for utilization of the measurements and of the trued position for controlling a machining cycle.

4,223,485

LAPPING TOOLS

Pierre A. Largeteau, Bezonz, France, assignor to S.A. Automobiles Citroen and Societe Dite Automobiles Peugeot, both of Paris, France

Filed Oct. 25, 1978, Ser. No. 954,487
Claims priority, application France, Nov. 3, 1977, 77 33677
Int. Cl.[3] B24B *5/00*
U.S. Cl. 51—355 **11 Claims**

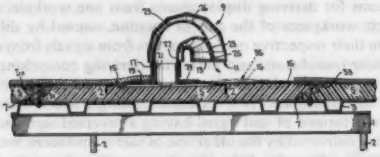
1. A lapping tool comprising:

an elongated tubular member having a working portion formed at one end thereof with a substantially cylindrical abrasive external surface and a frusto-conical internal surface, said working portion being provided with a plurality of rows of slots lying along respective generatrices and angularly spaced all around said working portion, said slots being throughgoing between said surfaces and elongated along the respective generatrices with the slots of each row being spaced apart, the slots of each row being staggered relative to the slots of adjacent rows such that a slot of each row lies opposite a space between slots of an adjoining row, said slots having lengths greater than that of said spaces along the respective generatrices; and

a control rod having a frusto-conical portion axially slidable within said working portion and cooperating with said

frusto-conical internal surface for adjusting the diameter of said working portion by relative axial displacement of said rod and said member.

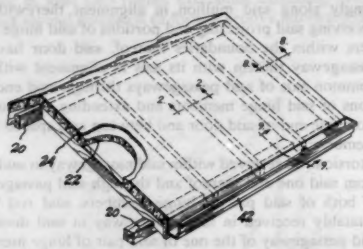
4,223,486
ROOF EQUALIZER
Thomas L. Kelly, 50 Randolph Ave., Waterbury, Conn. 06710
Filed Nov. 13, 1978, Ser. No. 960,471
Int. Cl.[2] E04F *17/04*
U.S. Cl. 52—1 **11 Claims**



1. A pressure equalizing system adapted for use on a flat roof the sides of which are unobstructed by adjoining structures which extend above the upper surface of the flat roof, the roof including a plurality of insulation blocks and a loosely laid membrane over said insulation blocks and spot bonded thereto, a plurality of one-way valves spaced apart on said roof and in communication with an area between the under surface of said loosely laid membrane and the upper surface of said insulation blocks and operable to relieve positive air pressure occurring between said loosely laid membrane and said insulation blocks and exhausting said positive pressure on the top surface of the roof one of said one-way valves being provided at each corner of the roof and additional valves being provided adjacent to but spaced from the sides of said roof, said additional valves being spaced from each other and from the corner valves a distance of approximately 50'.

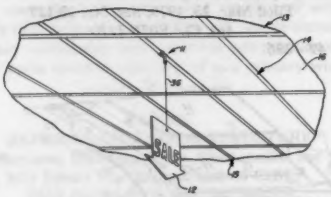
4,223,487
ROOF CONSTRUCTION AND METHOD OF MAKING THE SAME
Alfred L. St. Clair, 1103 Monroe St., Rochester, Ind. 46975
Filed Jan. 18, 1979, Ser. No. 4,377
Int. Cl.[3] E04D *13/00*
U.S. Cl. 52—11 **9 Claims**

1. In a building roof having a roof frame and roof underpanel members carried by said frame, the improvement comprising a plurality of thermoplastic panels arranged in marginally contacting relation and spanning said roof, and a plurality of spaced thermoplastic anchor members attached to and depending from said panels and extending through said underpanels with their lower ends projecting below said underpanels and



secured directly to said frame to provide anchorage of said thermoplastic panels to said roof, said thermoplastic panels being bonded together along their margins.

4,223,488
CEILING HANGER
Alois F. Schoenung, Naperville, Ill., assignor to Rapid Mounting & Finishing Company, Chicago, Ill.
Filed Apr. 30, 1979, Ser. No. 34,847
Int. Cl.[3] G09F *7/18*
U.S. Cl. 52—39 **15 Claims**



1. For use with a ceiling structure having a pair of flat ceiling panels having opposed edge portions carried on a horizontal supporting strip, an improved hanger comprising:

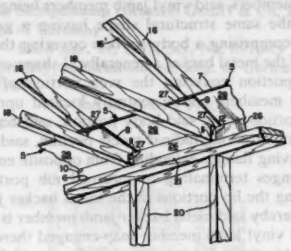
a plate having a U-shaped end portion adapted to embrace one edge of the supporting strip, a midportion adapted to underlie the supporting strip when the turned end is disposed to embrace the one edge thereof, a distal hanger porton, and a bendable connecting portion connecting the hanger portion to said midportion; and

a U-shaped retaining clip having a pair of spaced sidewalls and a bight portion connecting the sidewalls at one edge thereof, said bight portion being provided with a slot for extension of said plate hanger portion therethrough, said clip being adapted to embrace the edge of the supporting strip opposite said one edge to secure said midportion across the underside of the strip, said connecting portion being turned to cause said hanger portion to extend downwardly from said secured midportion and prevent movement of said clip away from its edge-embracing relationship with the supporting strip.

4,223,489
INSULATION STOP
Billy E. Bentley, 212 Avon Ct., Port Orange, Fla. 32019
Filed Nov. 29, 1978, Ser. No. 964,592
Int. Cl.[2] E04B *1/74*; F24F *7/00*
U.S. Cl. 52—92 **4 Claims**

1. An insulation stop comprising, in combination with two adjacent roof rafters, a rectangular sheet having a top edge and a bottom edge, said sheet having slots disposed parallel to said edges and extending inwardly from the ends thereof, said slots

being in alignment with one another and terminating a substantial distance apart to form attaching tongues between end portions of said bottom edge and said slots, said tongues extending substantially perpendicular from the plane of the sheet in the same direction and being spaced apart a distance corresponding to the spacing between adjacent sides of adjacent ceiling joists against which said tongues abut and are secured, the part of said sheet disposed between said tongues constituting a vertical wall closing the opening between said joists, said sheet having a fold line extending between adjacent ends of



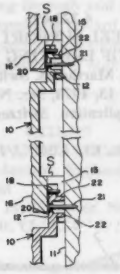
said slots, said fold line and the slots, said top edge and the end portions disposed between the slots and top edge, combining to form a large flat panel disposed at an oblique angle to said upright wall and extending between said adjacent roof rafters and in an underlying relationship to bottom surfaces thereof, and means securing said panel to said bottom surfaces of the roof rafters to combine with said upright wall to form an insulation stop and with portions of the roof and said two roof rafters to provide a passage for the free circulation of air from the surrounding atmosphere between the roof and ceiling.

4,223,490

SPACING MEANS FOR WALL PANELS

Robert S. Medow, 1251 NW. 165th St., Miami, Fla. 33169

Filed Apr. 13, 1979, Ser. No. 30,069
Int. Cl.³ E04D *1/00*
U.S. Cl. 52—98 4 Claims



1. In a plurality of panels for covering walls having an outer surface simulating brick, stone and the like, the combination comprising a slotted portion mounted along one edge of each of said panels and a flange portion mounted along a second edge of said each of said panels and a plurality of substantially breakable spacing members mounted in said slotted portion whereby upon the mounting of said panels on a wall, said flange portion of one of said panel is received in said slotted portion of an adjacent panel in abutting relation with said spacing members whereby upon the expansion of said panels, said spacing members will be broken away and said panels will expand in a direction toward each other.

4,223,491

GUY WIRE GUARD

Wilbur C. Vaughn, P.O. Box 422, 337 Market St., Berwick, Pa. 18603

Filed Oct. 6, 1978, Ser. No. 949,151
Int. Cl.² E04H *12/20*; H01B *17/58*
U.S. Cl. 52—147 5 Claims

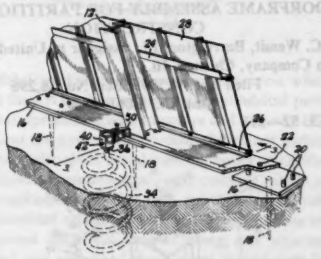
1. A guard for a guy wire or the like, comprising an elongate tubular body of weather and impact resistant plastic material having the form of a long resilient sheet of such material bent about an axis longitudinal thereof to enclose a space for containing a guy wire and having oppositely disposed confronting longitudinal edge portions that protrude in a direction away from said axis to define a substantially radially disposed slit along said body between opposing inner surfaces of said edge portions, said body having in cross-section substantially a tear drop shape, said edge portions being spreadable apart elastically by a pushing of said body against a guy wire between said edge portions, to admit a guy wire into said space, and means comprising sets of holes in opposite wall portions of said body at locations to receive bolts extending across said space between said slit and a guy wire in said space for contracting said opposite wall portions in a direction transverse to said slit to press said edge portions together and hold said body secure upon the guy wire.

4,223,492

BUILDING ANCHOR

Alfred L. St. Clair, 1103 Monroe St., Rochester, Ind. 46975

Filed Jan. 18, 1979, Ser. No. 4,381
Int. Cl.³ E02D *5/47*
U.S. Cl. 52—157 10 Claims



1. Means for anchoring a building having a rigid anchor plate supporting a building frame, comprising

a plurality of elongated auger type ground penetrating anchors located adjacent to and laterally spaced from said building frame anchor plate at spaced points,

an adapter member releasably secured to the upper end of each ground anchor,

a lock member carried by each adapter member and extending laterally therefrom and above a part of said building frame anchor plate, and

means for positioning each lock member in firm overlying downwardly pressing engagement with said building frame anchor plate.

4,223,493
MULTI-LAYERED SKYLIGHT

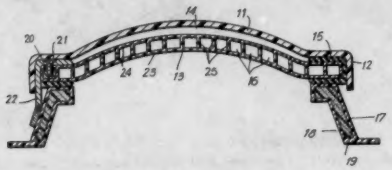
Theodor P. Moench, Griesheim, and Friedrich Hanstein, Gross-Zimmern, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 20, 1978, Ser. No. 943,949

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1977, 2746495

Int. Cl.[2] E04B *7/18*; E04D *13/03*

U.S. Cl. 52—200 **7 Claims**



1. A multi-layered skylight having an outer element with a central domed portion, a substantially planar circumferential edge portion and a circumferential skirt portion extending downwardly from said edge portion, said outer element comprising a monolayer of a synthetic resin which transmits light, and an inner element of one-piececonstruction with a central domed portion and a substantially planar circumferential edge portion, said inner element comprising at least two sheets of a synthetic resin which transmits light, said sheets being closely spaced and parallel to one another, and having a plurality of elongated supporting elements integrally formed therewith and extending therebetween across the dimensions of said sheets between the substantially planar circumferential edge portions thereof and dividing the space between said sheets into a plurality of separate elongated chambers, said inner and outer elements being arranged with the planar edge portion of said inner element being located below the planar circumferential edge portion of the outer element within and surrounded by the circumferential skirt portion of said outer element, with the domed central portions of said inner and outer elements having substantially the same curvature and extending in substantially parallel spaced relationship to one another.

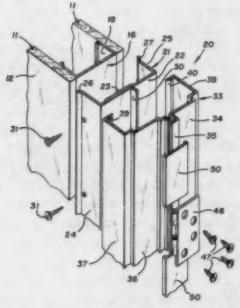
4,223,494
DOORFRAME ASSEMBLY FOR PARTITION WALL CONSTRUCTION

Alan C. Wendt, Barrington, Ill., assignor to United States Gypsum Company, Chicago, Ill.

Filed Apr. 9, 1979, Ser. No. 28,296

Int. Cl.[3] E06B *1/04*

U.S. Cl. 52—211 **21 Claims**



1. A doorframe assembly comprising in combination:

metal backer jamb members adapted for attachment to opposite sides of a door opening, said members being of substantially the same structural shape having a web portion connecting two free legs forming a generally U-shape wherein a portion of the web is thicker than remaining portions, said free legs of the U-shape being adapted for fastening at opposite wall face surfaces adjacent a door opening, the free legs terminating in lip portions wherein at least one metal backer jamb member has a cutout portion, adapted for coaction with door locking means, located along the thicker web portion;

vinyl jamb members snap-engaged with the metal backer jamb members, said vinyl jamb members being of substantially the same structural shape having a generally U-shape comprising a body portion covering the web portion of the metal backer a generally U-shape comprising a body portion covering the web portion of the metal backer members and a centrally located upraised door stop portion along said body portion, said body portion also having a longitudinal recess portion, said body portion having flanges extending from opposite ends thereof, the flanges terminating in inturned nib portions snap-engaging the lip portions of the metal backer jamb member whereby said metal backer jamb member is enveloped by said vinyl jamb member snap-engaged thereto;

hinge plate means for supporting a door, said hinge plate means attached along the longitudinal recess of a vinyl jamb member at a side of a door opening;

a strike plate means for receiving door locking means, said strike plate means attached in positional correspondence with a cutout portion of a metal backer jamb member along the longitudinal recess of a vinyl jamb member adapted for positioning at a side of a door opening opposite the vinyl jamb member having the hinge plate means;

mortising vinyl trim adhered along remaining open portions of the longitudinal recesses of the vinyl jamb members, said trim having a thickness substantially the same as the hinge plate means and strike plate means providing a mortised generally planar finished surface along the vinyl jamb members; and wherein the web portion of the metal backer jamb members comprises a centrally located inturned leg portion positionally corresponding with the door stop portion of the snap-engaged vinyl jamb member wherein said inturned leg extends inwardly of the door opening and projects into the upraised door stop portion.

4,223,495
PRESTRESSED STEEL SUPPORT STRUCTURE AND METHOD OF ERECTING THE SAME

Emil Peter, Dammweg, Marthalen, Switzerland

Filed Oct. 13, 1978, Ser. No. 951,146

Claims priority, application Switzerland, Oct. 14, 1977, 12397/77

Int. Cl.[2] E04C *3/10*

U.S. Cl. 52—223 R **4 Claims**

1. An arched load-bearing structure comprising arched elements (**16**) and suspension elements (**15**) oppositely curved in a catenary shape and arranged adjacent one another,

horizontal carriers (**17**) supporting said elements (**16** and **15**),

at least one hollow profile member (**22**) extending in each suspension element (**15**),

at least one prestressing cable (**11**) extending internally through each hollow profile member (**22**), said cable being secured to the hollow profile member by a filler to form a tension element (**21**),

said tension element (**21**) extending in a catenary shape in the

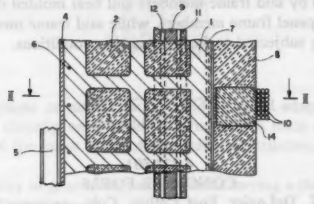
suspension elements (15) and over the horizontal carriers (17) into the arched elements (16), and
said cables (11) being anchored in the arched elements (16).

4,223,496

HIGH PRESSURE, HIGH-TEMPERATURE VESSEL, ESPECIALLY FOR NUCLEAR REACTORS

Paul Mitterbacher, Ketsch; Schöning, Josef, Hambrücken, and Hans G. Schwiers, Ketsch, all of Fed. Rep. of Germany, assignors to Siempelkamp Giesserei GmbH & Co. KG, Krefeld, Fed. Rep. of Germany

Filed Apr. 19, 1978, Ser. No. 897,849
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1977, 2717705
Int. Cl.[2] C04G *11/04*
U.S. Cl. 52—224 9 Claims



1. A pressure container, especially for a nuclear reactor, comprising:
a cylindrical pressure vessel of cast metal or concrete formed with axially throughgoing passages and having a substantially vertical axis, an outer wall and an inner wall;
respective axial tensioning elements extending through said passages and axially stressing said vessel;
a shell of thermally-insulating material surrounding the outer wall of said vessel and exposed to the exterior;
circumferential stressing cables extending around the outer wall of said vessel and spaced therefrom; and
a plurality of heat-blocking elements spaced around said vessel and extending through said shell while supporting said cables for transmitting inward force from said cables to said outer wall, said heat-blocking elements being composed of thermal insulation of high compressive strength.

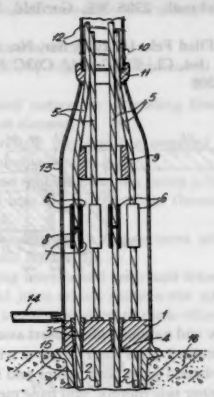
4,223,497

COUPLING ASSEMBLY

Hugh J. W. Edwards, Menston, England, assignor to CCL Systems Limited, England

Filed Jun. 26, 1978, Ser. No. 919,097
Int. Cl.[2] E04C *3/10*
U.S. Cl. 52—230 6 Claims

1. A method of connecting strands of adjacent first and second sections of a stressing tendon, each of said sections including plural parallelly disposed strands, each of said strands having an end portion terminating in a free end, comprising passing portions of the strands of said first section parallelly through anchoring means, locking said portions in said anchoring means with the end portions of said strands being spaced apart and disposed parallel to one another, disposing end portions of the strands of said second section parallel to one another so that the free ends thereof are coaxially with the free ends of the strands of the first section and are located closely adjacent thereto, directing portions of strands of the second section contiguous with the end portions thereof inwardly toward one another so that the spacing therebetween is less than the spacing between strands at the end portion of the first section, disposing the closely adjacent, axially aligned free ends of the strands of the first and second sections within



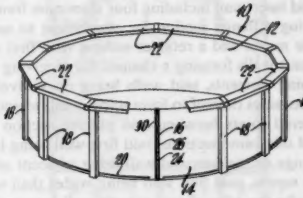
respective sleeves and compressing the sleeves so as to grip the strand ends.

4,223,498

PREFABRICATED SWIMMING-POOL CONSTRUCTION

Raymond Ventrice, West Caldwell, N.J., assignor to Swim 'N Play, Inc., Newark, N.J.

Filed Jan. 31, 1979, Ser. No. 8,054
Int. Cl.[2] E04G *11/06, 7/02*
U.S. Cl. 52—249 5 Claims

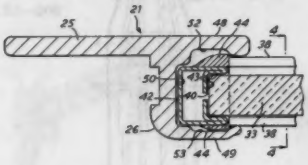


1. In a prefabricated swimming-pool construction wherein a flexible-sheet liner is backed by generally cylindrical peripherally continuous upstanding wall structure and wherein the wall surface adjacent the upstanding portion of the liner includes an elongate rectangular sheet-metal panel adapted to conform to a predetermined circumferential wall contour, each of the respective longitudinal ends of said panel being in independently preassembled relation with a metal reinforcement strip of predetermined thickness secured along and adjacent the panel end, and said strips and sheet metal at said ends having apertures at spaced locations along said strips, said apertures being aligned for bolting through both strips for a later-assembled overlapped-end relation of two adjacent ends of such panel or panels, the improvement wherein for each of said preassembled panel ends, said reinforcement strip is one of two, secured to each other on opposite sides of the end of the panel, with aligned bolt apertures through both the strips at each end of the panel, the thickness of each of the two reinforcement strips secured to each end of the panel being substantially less than said predetermined thickness, whereby the hoop-tension strength of a bolted and lapped later assembly of two panel ends thus doubly reinforced is substantially the same regardless of the front-to-back or back-to-front lapped relation of the lapped ends.

4,223,499
DECORATIVE STAINED GLASS INSERT UNIT FOR WINDOWS

Thomas R. Schrunk, 2306 NE. Garfield, Minneapolis, Minn. 55418

Filed Feb. 12, 1979, Ser. No. 11,187
Int. Cl.[2] E04C 1/42; C03C 27/08
U.S. Cl. 52—308 1 Claim

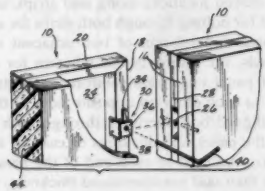


1. A window and a stained glass insert assembly, comprising, a decorative stained glass insert unit, a window unit having rectangularly shaped glass pane means and surrounding frame means on the inner side thereof, said pane means being recessed a predetermined distance relative to said frame means to accomodate the protruding therein of said stained glass insert unit, said stained glass insert unit including at least two panes of stained glass arranged to form a rectangularly shaped border, leaded came sections joining said panes, said came sections having ends spaced a short distance from said border, said insert unit including four zinc framing elements having generally hollow box shaped sections with the inner side of each said framing element being recessed a distance equal to said short distance for receiving the border edges of said panes, means joining said zinc framing elements, soldered joints for joining said came sections to each other and said zinc framing elements, said insert unit including four aluminum frame elements each having a flange section for attachment to said window unit frame means and a retainer section with first and second spaced apart walls forming a channel for receiving one of said zinc framing elements, said walls being respectively recessed on the inner sides thereof to form solder wells to accommodate said soldered joints between said glazing section frame elements and said came sections, said first wall being in the plane of said flange and said second wall being adjacent said window unit pane means, said first wall being wider than said second wall to make the edge of said second wall inconspicuous to a view from the flange side of said frame elements, and means joining said aluminum frame elements.

4,223,500
INSULATION MOLDED, LOAD BEARING, PREFABRICATED PANELS

Howard K. Clark, R.R. 2, Kellogg, Iowa 50135, and Archie A. Wilson, 3055 S. Farrell St., Chicago, Ill. 60608

Filed May 10, 1978, Ser. No. 904,462
Int. Cl.[2] E04C 1/00
U.S. Cl. 52—309.4 5 Claims



1. A prefabricated building panel, capable of bearing weight supporting loads, and having insulation premolded into the panel, comprising:

at least a pair of spaced apart metal rectangular frame members connected to each other by spacers which prevent substantial metal to metal contact between said frame members, the interior perimeters of said frame members defining an unobstructed open and freely accessible interior panel space,

said frame members being joined along one side by fastening bolts, extending from one panel member to the other,

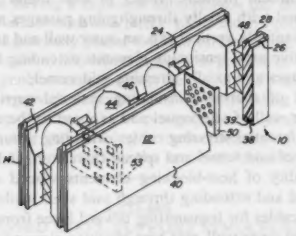
each pair of frames having on its side opposite said fastening bolts, a locking means for locking one pair of panel frame members to the fastening bolts of another pair of panel frame members, and

an expanded polymeric insulative material completely filling said interior panel space to define generally flat, planar, interior and exterior surfaces of said prefabricated panel which are exposed through said rectangular opening defined by said frame members and heat molded directly to said panel frame members, while said frame members are being subjected to foam expansion conditions.

4,223,501
CONCRETE FORM

Howard K. DeLozier, Fort Collins, Colo., assignor to Rocky Mountain Foam Form, Inc., Fort Collins, Colo.

Filed Dec. 29, 1978, Ser. No. 974,544
Int. Cl.[3] E04B 2/20; E04C 2/20
U.S. Cl. 52—309.11 11 Claims



1. In a self-supporting form of polymeric material comprising first and second sidewall members extending in length on either side of a cavity disposed to receive flowable construction material, the combination comprising:

a one piece transverse connecting member of sheet material extending between and embedded in said first and second sidewall members and comprising:

a central, connecting web portion extending between said first and second sidewall members and serving to define said cavity therebetween, and having therein a plurality of openings for permitting flow therethrough of said flowable construction material; and

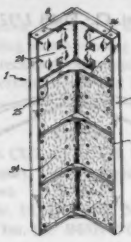
attachment flange means integral with said central, connecting web portion, extending transversely relative to the central, connecting web portion, embedded in at least one of said sidewall members, and located relatively closely adjacent an outer side surface of one of said sidewall members in a predetermined relationship to said length of the sidewall members for enabling location thereof and fixed mechanical attachment of building materials thereto,

said attachment flange means forming a substantially imperforate continuous planar surface for supportably receiving fastening members penetrating a sidewall member.

4,223,502
BUILDING PANEL WITH STONE FACING AND GLASS FIBER REINFORCED CONCRETE

Ralph C. Robinson, Redmond, Wash., assignor to Olympian Stone Company, Inc., Redmond, Wash.

Filed Mar. 8, 1978, Ser. No. 884,437
Int. Cl.[2] E04B 1/38; E04C 1/40
U.S. Cl. 52—315 6 Claims



1. A granite or marble faced building panel adapted to be mounted directly on a building structure to form at least a portion of the outer walls of said building structure comprising:

a plurality of granite or marble panels having a thickness of less than one inch;

anchor means mounted in the back surfaces of each of said granite or marble panels and extending rearwardly therefrom;

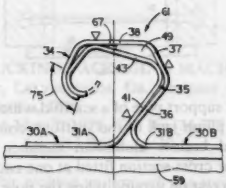
a support frame formed of glass fiber reinforced concrete overlying the back surfaces of all of said granite or marble panels and said anchor means, said support frame having a thickness substantially equal to or less than the thickness of said granite or marble panels; and,

glass fiber reinforced concrete support ribs integral with and extending rearwardly from said support frame, said support ribs having a thickness substantially equal to the thickness of said support frame and including openings therein adapted to receive fastener means for connecting said building panel directly to said building structure.

4,223,503
JOINT FOR BUILDING PANELS

James G. Hague, Mars, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 905,025, May 11, 1978, abandoned. This application Feb. 26, 1979, Ser. No. 14,999
Int. Cl.[2] E04D 3/361, 1/34
U.S. Cl. 52—478 25 Claims



1. A joint comprising:

adjacent central webs presenting confronting first and second web edges,

a polysurfaced female lip adjoined to the first web edge and comprising, in sequence, relative to the first central web edge:

an upwardly and inwardly extending first element,

an upwardly and outwardly extending second element,

an outwardly extending third element,

an outwardly and downwardly extending fourth element, and

a re-entrant terminal element;

a polysurfaced male lip adjoined to the second web edge and comprising:

an upwardly and outwardly extending first leg overlapping said first element,

a re-entrant arcuate terminal leg engaged with said re-entrant terminal element, and

said first leg and said terminal leg being joined by at least two distinct legs and intermediate thereof at least one arcuate bend,

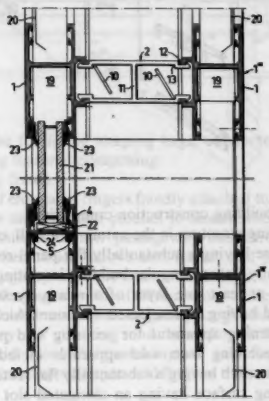
said arcuate bend being in engagement with an interior surface of said female lip;

said male lip being interlocked with said female lip thereby to provide said joint which secures the adjacent central webs in fixed angular relation to each other.

4,223,504
WALL SYSTEM

Timothy K. Potter, Trollhättan, and Raimundo Lopez Gomez, Vänersborg, both of Sweden, assignors to Gotaverken Aluminium AB, Goteborg, Sweden

Filed Jul. 25, 1978, Ser. No. 928,034
Int. Cl.[2] E04B 2/60
U.S. Cl. 52—479 17 Claims



1. An interlocking frame assembly for constructing and supporting a wall system and the like, and comprising:

a plurality of substantially similarly-shaped support sections, each support section having a substantially H-shaped cross-sectional configuration defined by two pairs of oppositely directed leg members attached to one another and a web portion extending therebetween,

each pair of said oppositely directed leg members having confronting leg surfaces, with at least one pair of projections formed on each pair of confronting leg surfaces;

each pair of said H-shaped support sections further including at least one pair of parallel extending, spaced flange members attached to an outer surface of said support section and extending substantially perpendicular with respect thereto;

at least one substantially H-shaped connecting means extending between and engaging a pair of said projections formed on confronting leg surfaces of each of two perpendicularly extending support sections for interlocking said perpendicular support sections to one another, and

at least one further substantially H-shaped connecting means extending between and engaging a pair of said parallel

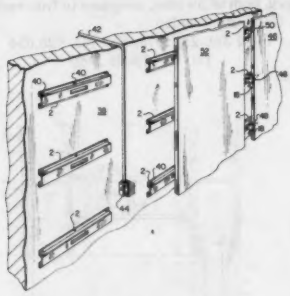
extending, spaced flange members attached to each of two parallel extending support sections for interlocking said parallel support sections to one another.

4,223,505

INSULATING PANEL FASTENING SYSTEM

Edgar A. Krebel; Walter Z. Vaden, and Robert H. Blanpied, all of Dallas, Tex., assignors to Rmax, Inc., Dallas, Tex.

Filed Sep. 15, 1978, Ser. No. 942,825
Int. Cl.² E04B *1/38*
U.S. Cl. 52—509 **8 Claims**



1. Panel building construction comprising:

a supporting structure in the nature of a wall, ceiling or roof structure having a substantially flat panel-receiving face;

substantially flat rectangular building insulating panels comprising at least one layer of a relatively soft insulating material having a preselected minimum thickness; and

panel fastening apparatus for securing said panels to said panel-receiving face, said apparatus including: channel members each having a substantially flat rectangular panel mounting surface having an elongated slot therein, side walls extending approximately perpendicularly from said panel mounting surface, and securement flanges extending approximately perpendicularly from said side walls, said securement flanges positioned against said panel-receiving face, said channel members having lengths less than the width of said panels, and said side walls having lengths selected to space said panel mounting surfaces from said supporting structure by a preselected distance; means rigidly attaching said securement flanges to said panel-receiving face; and, an anchoring clip having a rectangular web having a width no greater than said minimum thickness, a pair of panel securing flanges extending substantially perpendicularly and in mutually opposite directions from a first edge of said web, and a channel anchor extending from a second edge of said web, said channel anchor positioned within and anchored to said slot in said panel mounting surface, said panel securing flanges having pointed edges penetrating edges of the layer of insulating material of a pair of adjacent panels and thereby holding said pair of adjacent panels in contact with said panel mounting surface.

4,223,506

FRAMEWORKS AND LIKE STRUCTURES

John T. Blair, Single Quarters, South Witbank Colliery, Witbank, Transvaal Province, and Maurice J. Gleeson, Witkoppen Close, Witkoppen Rd., Rivonia, Transvaal Province, both of South Africa

Continuation-in-part of Ser. No. 798,721, May 19, 1977, abandoned. This application Sep. 11, 1978, Ser. No. 941,357
Claims priority, application United Kingdom, May 19, 1976, 20734/76
Int. Cl.² E04B *1/32*
U.S. Cl. 52—644 **10 Claims**

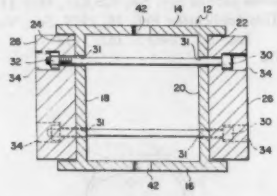
1. A framework comprising at least one frame member and wherein the framework extends in at least two dimensions, a linkage system associated with the framework and attached thereto at at least three non-collinear positions on the framework, said linkage system embodying two tension members, one of which extends from each of the two outer positions of said three non-collinear positions to the central position thereof where the tension members are each attached to one of two spaced points on a swivel member which is at least swivelable in the plane of the framework and is attached to the framework at the said central position by a connection with the swivel member being in tension between the connection and the points of attachment of the tension members and the connection being operable in use, to allow at least limited rotation about a point offset from the line of the tension members and thereby ensure that a change in tension in one of said tension members results in a rotation of the swivel member which causes a change in tension in the other tension member.

4,223,507

COMPOSITE ALUMINUM JACK POLES

Thomas E. Mascaro, 1278 Laurel Ave., Warminster, Pa. 18974

Filed Feb. 16, 1978, Ser. No. 878,293
Int. Cl.² E04C *3/30*
U.S. Cl. 52—730 **1 Claim**



1. A vertical support pole of a scaffold which pole is adapted for use with a pump jack of the scaffold, comprising

an elongated hollow aluminum member of substantially rectangular cross-section fitted at one end with a flat base adapted to rest on ground when the pole is in the vertical erect position, with

a pair of opposed sides of said pole each shaped with a continuous recess extending substantially for the length of the pole, with

a wooden member fastened in each said recess and extending for a substantially length of the pole, each said wooden member extending beyond the side of the pole in which it

is fastened so as to serve as a facing engageable by a pump jack of the scaffold, together with

a plurality of openings formed in each of the other two opposed sides of the support pole, with each opening in one of said sides located at a position with regard to an opening in the other of said sides such that an anchoring pin may be detachably fitted through both of said openings so as to serve as a detachable anchor for the pump jack, when the pump jack of the scaffold is to be held in place, including

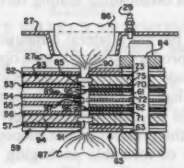
a plurality of staggered openings in said recesses and in said facings and securing means passing therethrough, wherein said facings have recessed openings for receiving therein bolts with countersunk heads and securing nuts.

4,223,508

DOUBLE-KNIFE CUT-OFF FOR CHUB MACHINE

Roy E. Wells, Davenport, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Mar. 16, 1978, Ser. No. 933,998
Int. Cl.³ B65B *9/08*
U.S. Cl. 53—138 R **8 Claims**



1. In a machine for forming chub packages and having: means for forming a web of packaging material into a tube; means for continuously feeding said tube downwardly over a hollow vertical mandrel; means for delivering a flowable product to said mandrel so as to continuously discharge product from the bottom end thereof into said tube; voider means for substantially voiding product from short lengths of said tube at predetermined intervals; reciprocating head means having a passageway through which said tube descends, said reciprocating head means containing oscillating opposed passage restricting members which gather voided short lengths of said tube, first means adjacent said passage restricting members for applying a pair of spaced clips to each said gathered length; and, second means adjacent said passage restricting members for severing said gathered tube intermediate said pairs of clips; the improvement wherein said severing means includes a pair of spaced apart knives for cutting through said gathered lengths at two different positions thereon, each cut being in close proximity to one clip of said pair thereof, said cuts defining a scrap piece of said tubing, and means positioned intermediate said pair of knives for removing said scrap piece from each of said packages.

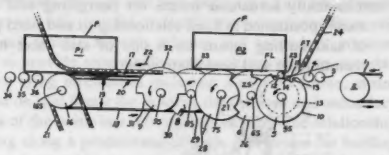
4,223,509

FILM TUCKING PACKAGING MACHINE

Roger A. Ziecker, Lawrenceville, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed May 7, 1979, Ser. No. 36,778
Int. Cl.³ B65B *11/10*
U.S. Cl. 53—209 **10 Claims**

1. A machine for tucking underneath the trailing part of a moving package the trailing part (FT) of a film arranged in overlying partially enveloping relation to the package, said machine comprising a plurality of notched rollers (**5–9**) arranged for rotation about horizontal axes (**55–95**) respectively spaced apart in the direction of movement of the package for supporting and moving the package, the notches (**11, 25, 27, 29, 31**) in said rollers being angularly displaced in sequence relative to each other, means (**19**) for rotating said rollers in synchronism with each other, and a film tucking bar (**23**) movable into engagement with the trailing part (FT) of said film and



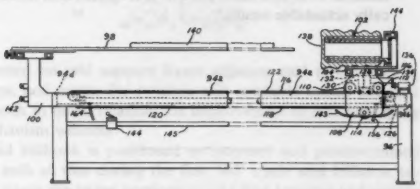
into said notches in sequence so as to tuck said trailing part of said film underneath the trailing part of the package.

4,223,510

FILLING MACHINE FOR SLEEPING BAGS, COMFORTERS AND THE LIKE

David R. Cash, Louisville, Ky., assignor to James Cash Machine Co., Louisville, Ky.

Filed Feb. 28, 1979, Ser. No. 15,900
Int. Cl.³ B65B *39/06, 39/14*
U.S. Cl. 53—258 **6 Claims**



1. A machine for filling sleeping bags, comforters and the like with filling material comprising

a supporting frame,

a plurality of elongated fingers fixedly attached to and above said frame and disposed parallel to one another,

a spout defining a hollow passageway therethrough movably attached to and above said frame, said passageway being in registry with the ends of said fingers, and

means for effecting movement of said spout along said frame to advance and retract said fingers through and out of said passageway for carrying and extending a bag spread around said spout along and around said fingers and a filling material spread upon said fingers, to thereby fill said bag.

4,223,511

PVC FOIL CUTTER

John W. Black, Hickory Corners, Mich., assignor to Pemco-Kalamazoo, Inc., Kalamazoo, Mich.

Filed Mar. 19, 1979, Ser. No. 21,621
Int. Cl.³ B65B *41/16, 67/10*
U.S. Cl. 53—390 **9 Claims**

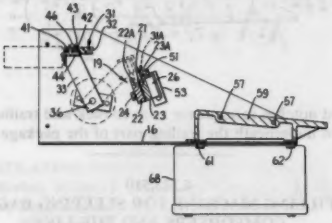
1. In semiautomatic means for facilitating the wrapping of an article in a piece of sheet material, an adapter for cooperating with a conventional table having a working surface and sheet material dispensing means, the improvement comprising in combination:

frame structure positionable in fixed relationship to said working surface;

a power source and electrically actuatable mechanical cutting means energizable thereby spaced from a proximate edge of said working surface to define a space therebetween through which said sheet material may be drawn, said cutting means comprising a fixed portion fixed to said frame structure and a movable portion pivotally mounted on said frame structure in such a manner that in its at rest

position it will lie adjacent said proximate edge and be substantially spaced from said fixed portion to facilitate the passage of said sheet material therebetween; and

mechanically actuatable means for energizing said cutting means positioned in fixed relationship to said fixed portion of said cutting means on a side of said sheet material remote from said proximate edge;



whereby sheet material may be drawn through said space wrapped around said article on said working surface and the cutting means then actuated by drawing said sheet material over said fixed portion and against said mechanically actuatable means.

4,223,512

METHOD OF PACKAGING AND STERILIZING PRODUCTS

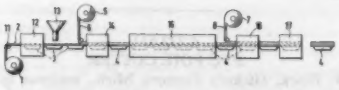
Norbert Buchner, Winnenden, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 27, 1978, Ser. No. 963,709

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753177

Int. Cl.³ B65B *55/02*

U.S. Cl. 53—425 **2 Claims**



1. A method for packaging products, particularly food products, and for sterilizing them in an alternating high-frequency electromagnetic field, comprising the steps of:

forming a traveling laminate having a metallic layer into a container to provide a trough-like area into which a product is to be introduced;

advancing the formed container past a product discharge point to deposit a predetermined quantity of said product into said container;

covering the container with a synthetic film introduced thereover from a traveling web;

moving the containers seriatim through a high-frequency microwave field and

applying a sealing layer of a metallic foil over the synthetic film.

4,223,513

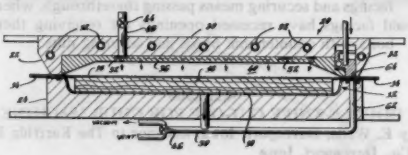
PACKAGING APPARATUS FOR FORMING SPECIALLY SHAPED PACKAGES

Reid A. Mahaffy, Montclair; Joseph M. Psota, Hawthorne, and John A. Giordano, West Paterson, all of N.J., assignors to Mahaffy & Harder Engineering Co., Totowa, N.J.

Continuation of Ser. No. 856,218, Dec. 1, 1977, which is a division of Ser. No. 748,650, Dec. 8, 1976, Pat. No. 4,085,565. This application May 29, 1979, Ser. No. 42,805

Int. Cl.³ B65B *31/02*

U.S. Cl. 53—432 **2 Claims**



1. The method of making a package comprising the steps of:

placing a product in a cup-shaped receptacle made of formable packaging material and having a flange around the mouth thereof establishing sealing surfaces in the plane of said mouth;

said receptacle having a lateral dimension greater than the width of the product so as to create open regions between the product side surfaces and the receptacle side walls;

said receptacle having a depth such that the top surface of the product is at least approximately aligned with said flange when the product is first placed in the receptacle;

placing a sheet of formable packaging material over said mouth and said sealing surfaces to define a container therebetween, said sheet including outer portions located above said open regions;

establishing a sealed chamber around said container;

evacuating said container and the spaces within said chamber which are above and below said container;

sealing said sheet of packaging material to said receptacle to produce an hermetically sealed package; and

controllably venting the spaces of said chamber above and below said container (1) to develop a net differential force causing relative movement of said outer sheet portions towards the product so as to form said sheet portions down along the side surfaces of the product into said open regions to an intermediate point between the bottom and top surfaces of the product, and (2) to press the side walls of said receptacle inwardly to the product side surfaces to effect engagement between said sheet and said receptacle side wall at said intermediate point in the region immediately adjacent the side surface of the product, creating a crowned effect wherein the flange line is at said intermediate point below the top surface of the product.

4,223,514

KNIFE SECTION

Lawrence M. Halls, New Holland, and Horace G. McCarty, Lancaster, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Mar. 20, 1979, Ser. No. 22,241

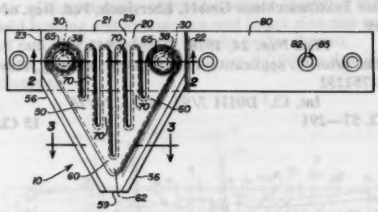
Int. Cl.³ A01D *55/02*

U.S. Cl. 56—299 **16 Claims**

1. In a knife section for a reciprocating mower having a substantially rectangular base portion defined by a base edge and two opposing non-cutting side edges, said base portion having two spaced apart holes therethrough; an upper surface; an opposing lower surface substantially parallel to said upper surface, said lower surface defining a lowermost plane; and a generally triangularly shaped body portion integral with said base portion, including two converging cutting edges extending, respectively, from said two non-cutting side edges, said body portion being defined at the base thereof by said base

portion and defined at the sides thereof by said cutting edges, the improvement comprising:

a reinforcing ridge parallel to each said cutting edge, said reinforcing ridges partially defining an elevated plane above and parallel to said upper surface, each said reinforcing ridge continuing onto said base portion to encompass the respective said hole; and



a plurality of rounded ribs projecting from said lowermost plane substantially to said elevated plane, said ribs extending from said body portion onto said base portion.

4,223,515

TREE SHAKER MOUNTING

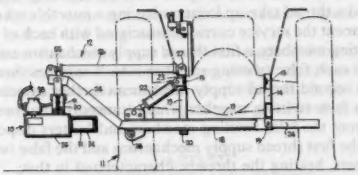
Leslie J. Borchard, Mile End, Australia, assignor to M.B.P. (S.A.) Pty. Limited, Mile End, Australia

Filed Jan. 24, 1979, Ser. No. 6,118

Claims priority, application Australia, Jan. 25, 1978, PD3128

Int. Cl.[2] A01D *46/00*

U.S. Cl. 56—328 TS **4 Claims**



1. A mounting for securing a tree shaker to a tractor, comprising:

a pair of brackets,

securing means which secure said brackets to respective sides of the tractor,

a guide extending beneath the chassis of the tractor transversely with respect to the direction of tractor travel,

connecting means joining the guide to one of the brackets,

a slide projecting from one side of the tractor,

inter-engaging surfaces on the slide and guide guiding the slide for transverse movement,

a piston/cylinder assembly coupling the slide and a mounting means which is fixed with respect to one of the brackets, and operative to effect said transverse movement,

and means coupling the tree shaker to the projecting end of the slide.

4,223,516

KNOTTING MECHANISM

Marc G. Vansteelant, Zedelgem, Belgium, assignor to Sperry Corporation, New Holland, Pa.

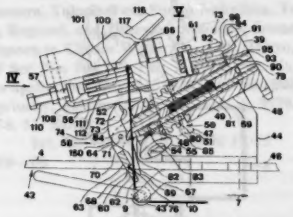
Filed Jun. 16, 1978, Ser. No. 916,313

Claims priority, application United Kingdom, Jun. 21, 1977, 25939/77

Int. Cl.[3] A01D *59/04;* **B65B** *13/26*

U.S. Cl. 56—343 **14 Claims**

1. In a crop baling machine having an elongate bale case, a pickup and infeed mechanism for delivering crop material into said bale case, a packing mechanism at least partially within said bale case for compressing the crop material therein into a compact mass and forcing it through said bale case, a twine dispensing mechanism including at least one twine carrying needle movable through said bale case, and a knot tying mechanism on said bale case for cyclically receiving twine from said needle and tying a knot in primary and secondary portions thereof to provide separate discrete packages of crop material, said knot tying mechanism including a support frame, means mounted on said frame for holding the primary and secondary portions of the twine in a substantially side-by-side relationship extending along a predetermined path, said means for holding including a rotatable means, said path movable with the rotation of said rotatable means between at last first and second positions, a billhook including a first elongate shaft rotatably



mounted on said support frame adjacent said twine holding means, and means for rotating said rotatable means and said billhook in timed relation, the improvement in said knot tying mechanism wherein:

said billhook is positioned to intersect said predetermined path so that during the first 360° cycle said billhook engages the twine portions at said first location and repositions the primary and secondary portions of twine thereabout, and during a second 360° cycle said billhook grips said twine portions at said second position and forms a knot therein, said billhook being positioned at the end of said second cycle in general alignment with the path of travel of the bale in said bale case so that the knot is pulled off said billhook by the motion of the bale.

4,223,517

METHOD AND MECHANISM FOR ELIMINATION OF AN IRREGULARITY IN A YARN

Gerd Husges; Edmund Schuller; Rupert Karl, and Eberhard Grimm, all of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Dec. 18, 1978, Ser. No. 970,655

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758064

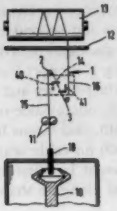
Int. Cl.[3] D01H *15/00, 11/00*

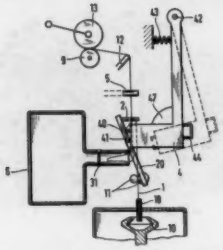
U.S. Cl. 57—261 **14 Claims**

1. A method of elimination of an irregularity in a yarn which includes two parallel sections of yarn, one of which extends to a pair of draw-off rolls and the other to a bobbin, said two parallel sections being laid into a knotting mechanism which joins the two sections of yarn together and severs the superfluous ends of the yarn, the improved method comprising the following steps:

deflecting said yarn extending from said draw-off rolls to said bobbin in such a way that said yarn adopts an N-shaped run of yarn containing an oblique connection section between said two parallel sections; and

maintaining said oblique connecting section out of the working range of said knotting mechanism as said knotting





mechanism is brought forward perpendicularly up to said N-shaped run of the yarn.

4,223,518

SUCTION AIR NOZZLE FOR FORMING A THREAD RESERVE

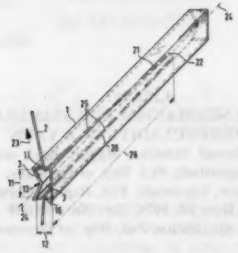
Rupert Karl, and Edmund Schuller, both of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Filed Jan. 22, 1979, Ser. No. 5,505

Claims priority, application Fed. Rep. of Germany, Jan. 24, 1978, 2802913

Int. Cl.³ D01H *15/02*

U.S. Cl. 57—263 **6 Claims**



1. An elongated suction air nozzle (1) for forming a thread reserve in the form of a loop in thread running past the mouth of said nozzle, said elongated air nozzle having an inside dimension extending in a direction of thread travel which is substantially greater than a smaller inside dimension transverse thereto producing an elongated cross-section, the improvement comprising:

a constriction (13) provided in said nozzle and extending for the whole length of the expected loop size; and

said constriction (13) dividing said cross-sectional area (3) of said nozzle as seen in the direction of travel of said thread into two partial areas (30, 31; 32, 33).

4,223,519

FALSE TWISTING-STRETCHING/TEXTURIZING MACHINE

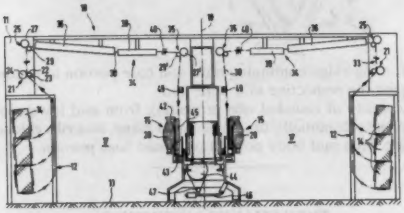
Günter König, Uhingen-Baiereck; Günter Mütschler, Aichelberg; Erich Scheutle, Weissenstein, and Erich Bucher, Göppingen, all of Fed. Rep. of Germany, assignors to Firma Zinser Textilmaschinen GmbH, Ebersbach, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,238

Claims priority, application Fed. Rep. of Germany, Nov. 23, 1977, 2752232

Int. Cl.³ D01H *7/92, 13/26, 13/28*

U.S. Cl. 57—291 **15 Claims**



1. A false twisting-stretching/texturizing machine for endless threads, especially in the titer region dtex 17-220, each thread comprising about 3–48 filaments, and including a plurality of false twisting members each arranged to false twist one of the threads, a service corridor extending in the longitudinal direction of the machine, a spool rack for holding supply spools and a thread take-up location having a movable take-up spool adjacent the service corridor associated with each of said false twisting members, a first thread supply mechanism associated with each false twisting member which supplies threads thereto, a second thread supply mechanism further associated with each false twisting member which transports the threads coming from the false twisting members and heaters disposed between the first thread supply mechanisms and the false twisting members, heating the threads, characterized in that;

said supply spool rack is located on one side of the service corridor and said thread take-up mechanisms are located on the other side of said service corridor, said first thread supply mechanisms are located above said supply spool rack and said second thread supply mechanisms are located above said thread take-up locations, and said heaters and said false twisting members are disposed approximately horizontally whereby each of said threads travels from its associated heater to the associated false twisting member in an approximately straight line and approximately horizontally and wherein said heater includes a longitudinal, downwardly directed heating surface, said heating surface being provided with a concave groove having a base extending in the direction of travel of said thread, the base of said groove making contact with the advancing thread for the purpose of heating.

4,223,520

METHOD AND APPARATUS FOR BULKING YARN

Robert L. Whitted, Greenville, and James E. Simmons, Marietta, both of S.C., assignors to Poinsett Machine Works, Inc., Greenville, S.C.

Continuation-in-part of Ser. No. 655,671, Feb. 9, 1976, Pat. No. 4,064,686, which is a continuation-in-part of Ser. No. 553,838, Feb. 2, 1975, abandoned. This application Dec. 20, 1977, Ser. No. 862,640

Int. Cl.³ D02G *1/16*

U.S. Cl. 57—350 **11 Claims**

1. An apparatus for bulking strands of multi-filament yarn comprising:

an elongated housing;

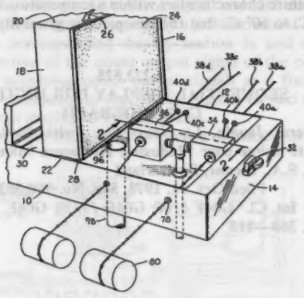
a longitudinal cylindrical bore extending through said housing;

said longitudinal bore having a larger diameter portion at an entrance end thereof and a reduced diameter portion adjacent an exit end thereof;

said larger diameter portion being from about 5/16 of an inch to 7/16 of an inch in diameter;

a pair of diametrically opposed passages extending through said housing and intersecting said larger diameter portion of said longitudinal bore at right angles thereto;

said air passages being from about 1/16th to ¼th inch in diameter;



a source of pressurized gas;

means for connecting said source of pressurized gas to said pair of opposed passages for supplying opposed streams of gas into said bore;

eyelets of wear resistant material carried adjacent opposed ends of said longitudinal bore,

means for feeding said strands through said bore between said opposed streams of gas producing spaced alernate interwoven plaited segments of said strands and segments of loose filaments having a larger cross section.

4,223,521

WRISTWATCH MOVEMENT

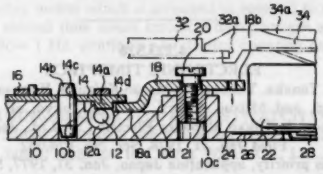
Mituo Saitoh, Tokyo, and Yasuo Kamiyama, Sayama, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1978, Ser. No. 925,716

Claims priority, application Japan, Jul. 25, 1977, 52/99309

Int. Cl.[3] G04C *3/00*; G04B *27/00*

U.S. Cl. 368—204 **6 Claims**



1. A movement for a wristwatch powered by a battery and having a back cover formed with a battery replacement hole to which a battery hatch is removably mounted, comprising:

a base plate having on its one surface formed with a battery compartment in a substantially axial alignment with the battery replacement hole, and a radially extending bore;

a winding stem slidably and rotatably disposed in the radially extending bore of said base plate, and having a groove portion formed at an intermediate part of said winding stem;

a setting lever pivotally mounted on said one surface of said base plate, said setting lever having one end formed with a dowel portion normally engaging said groove portion of said winding stem, and a tip portion; and

an actuating lever rockably mounted on said one surface of said base plate, said actuating lever having its one end formed with an engaging portion extending below said tip portion of said setting lever, and another end formed with a handling portion extending toward said battery compartment such that said handling portion can be actuated in an axial direction of said movement through said battery replacement hole to cause said engaging portion to move said tip portion in a direction away from said groove portion to allow removal of said winding stem out of said base plate.

4,223,522

ELECTRONIC TIMEPIECE

Yasushi Nomura, Tokorozawa; Fumio Nakajima, Tokyo; Kenji Yamada, Koganei, and Takayasu Machida, Iruma, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

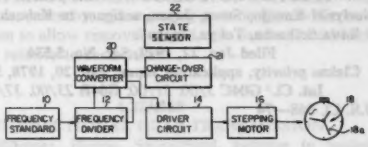
Division of Ser. No. 764,790, Feb. 2, 1977, Pat. No. 4,129,981.

This application Nov. 13, 1978, Ser. No. 960,516

Claims priority, application Japan, Feb. 6, 1976, 51/11973; Feb. 9, 1976, 51/13093

Int. Cl.[2] G04C *3/00*; G04B *37/12*

U.S. Cl. 368—66 **8 Claims**



1. An electronic timepiece, powered by a battery, comprising:

a frequency standard providing a relatively high frequency signal;

a frequency divider providing relatively low frequency signals in response to said relatively high frequency signal;

a waveform converter including first circuit means responsive to said relatively low frequency signals for providing a first pulse train comprising a first series of single pulses consisting of a single pulse produced at the start of each of a series of first unit time intervals, said first pulse train being generated by said first circuit means during normal operation of the timepiece, and second circuit means for providing a second pulse train comprising successive groups of pulses, each of said groups of pulses comprising a predetermined plural number of pulses, the duration of each of said groups of pulses being less than that of each of said first unit time intervals, one of said groups of pulses being produced at the start of each of a series of second time intervals, each of said second unit time intervals having a duration equal to that of said first unit time interval multiplied by a factor which is equal to said predetermined plural number plus one, said second pulse train further comprising a second series of single pulses consisting of a single pulse produced at a predetermined time following the completion of one of said groups of pulses and prior to the commencement of an immediately succeeding group of pulses;

a driver circuit responsive to said first pulse train for providing normal drive pulses and responsive to said second pulse train for providing modulated drive pulses;

means for selectively rendering said first circuit means operative while said second circuit means is held inoperative and rendering said first circuit means inoperative while said second circuit means is held operative, in accordance with whether the timepiece is in a normal and an abnormal operating condition respectively;

a stepping motor responsive to said normal drive pulses for

rotating a rotor thereof through a unit angular displacement at the start of each of said first unit time intervals and responsive to said modulated drive pulses for successively rotating said rotor through said unit angular displacement by a number of times equal to said predetermined plural number at the start of each of said second time unit intervals, and for further rotating said rotor once through said unit angular displacement during each of said second unit time intervals; and

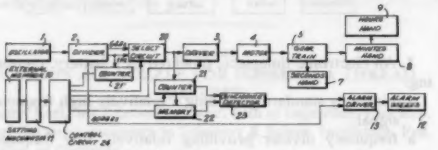
display means including at least one hand which is driven by said rotor to be advanced by a single step, which corresponds to one of said first unit time intervals, in response to each rotation of said rotor through said unit angular displacement, whereby said hand is advanced by one step for each of sid first unit time intervals when the timepiece is in said normal operating condition and whereby said hand is advanced by a number of steps equal to said predetermined plural number at the start of each of said second unit time intervals and is further advanced by a single step during each of said second unit time intervals, when the timepiece is in said abnormal operating condition, whereby an indication is givent of said abnormal operating condition.

4,223,523

ELECTRONIC ANALOG ALARM TIMEPIECE

Noriyuki Kamijo, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Jan. 22, 1979, Ser. No. 5,534
Claims priority, application Japan, Jan. 20, 1978, 53/5370
Int. Cl.³ G04C *3/00, 21/00;* **G04B** *23/00, 37/12*
U.S. Cl. 368—74 **25 Claims**



10. A method of setting a secondary function in an electronic analog wristwatch for timekeeping including a high frequency oscillator, a frequency divider network, hands for indicating time, a driver operating from said driver network output to move said hands, circuits for monitoring hand positions, and means for providing a secondary function, comprising the steps of:

(a) advancing said hands from a first present time to any desired setting time representative of said secondary function;

(b) returning said hands to the actual present time, said actual present time being the first present time plus the time elapsed in advancing and returning said hands, whereby said circuit means actuate said secondary function when said secondary function setting time occurs.

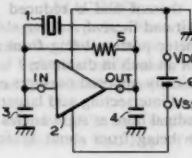
4,223,524

QUARTZ OSCILLATION CIRCUIT FOR ELECTRONIC TIMEPIECES

Hisahide Nakagawa, Tachikawa, Japan, assignor to Citizen Watch Co., Ltd., Japan

Filed Mar. 16, 1979, Ser. No. 21,114
Claims priority, application Japan, Mar. 17, 1978, 53-30620; Feb. 15, 1979, 54-16564
Int. Cl.² G04C *3/00;* **H03L** *1/00*
U.S. Cl. 368—156 **6 Claims**

1. A quartz oscillation circuit for electronic timepiece comprising an inverter for operating as an amplifier, an input capacitor connected to the input of the inverter and an output capacitor connected to the output of the inverter, one of the capacitors having substantially positive temperature characteristics and the other capacitor having substantially negative



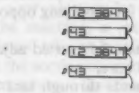
temperature characteristics within a temperature range of from −20° C. to 60° C. that the timepiece is generally used.

4,223,525

SEQUENTIAL DISPLAY FOR DIGITAL CHRONOGRAPH

Jean-Pierre Jaunin, La Neuveville, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed Oct. 11, 1978, Ser. No. 950,353
Int. Cl.³ G04F *8/00;* **G04B** *19/30;* **G04F** *7/04*
U.S. Cl. 368—113 **9 Claims**



1. A timepiece having an electronic digital display of predetermined display capacity, storing means for storing a quantity of display information exceeding said predetermined display capacity, detecting means for detecting the presence of overflow display information exceeding said predetermined display capacity and connecting means responsive to a signal from the detecting means indicating the presence of said overflow information for connecting the display in an alternating sequence to information normally present and to said overflow information.

4,223,526

ELECTRONIC TIMEPIECE

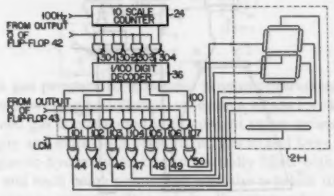
Teruaki Tanaka, Yokohama; Masao Kaizuka, Kawasaki; Yuichi Takagi, and Mitsuo Aihara, both of Tokyo, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Jan. 31, 1978, Ser. No. 874,052
Claims priority, application Japan, Jan. 31, 1977, 52-9399
Int. Cl.³ G04B *19/30*
U.S. Cl. 368—84 **12 Claims**

1. An electronic timepiece comprising an oscillation circuit, a first time count circuit for performing an ordinary time count operation in response to an output signal of the oscillation circuit, a second time count circuit having a plurality of counters and adapted to perform a stopwatch time counting operation in response to an output signal of the oscillation circuit, liquid-crystal display means including a plurality of display sections, decoder means for decoding output count signals of said first and second time count circuits and delivering decoded output signals to said display means, a control circuit for connecting said first and second time count circuits selectively

to said display means, said control circuit including means for generating a first control signal when said second time count circuit is performing a stopwatch time counting operation and a second control signal when said stopwatch time counting operation is terminated, and count display inhibiting means adapted, when said second time count circuit is connected by said control circuit to said display means to permit a stopwatch time counting operation, to render ineffective the count output signal of at least one counter in said second time count circuit supplying signals at a frequency in excess of 1 Hz., said count display inhibiting means including gating means for passing data from said second time count circuit to said display means, said gating means being gated off by said first control signal and gated on by said second control signal, and said inhibiting means being further adapted to supply a predetermined display signal to the corresponding display section in said display means irrespective of the count output signal of the counter, the counters supplying count output signals at a frequency below 1 Hz. continuing to supply said signals to said display means to permit display of counting data.

11. An electronic timepiece comprising an oscillator, a first



time count circuit for performing a normal time count operation in response to the output signal of the oscillator, a second time count circuit for performing a stopwatch time counting operation in response to an output signal of said oscillator, liquid-crystal display means for displaying the contents of said first and second time count circuits, means for generating a first control signal in response to the commencement of a stopwatch time counting operation by said second time count circuit and a second control signal in response to the termination of said stopwatch time counting operation, and count display inhibiting means adapted, when said second time count circuit performs said stopwatch time counting operation, to inhibit the operation of a portion of said display means which is arranged to respond to a signal from said second time count circuit which changes at a frequency in excess of 1 Hz, said count display inhibiting means including gating means for passing data from said second time count circuit to said display means, said gating means being gated off by said first control signal and gated on by said second control signal, the portion of said display means which is arranged to respond to a signal from said second time count circuit which changes at a frequency below 1 Hz. continuing to display counting data.

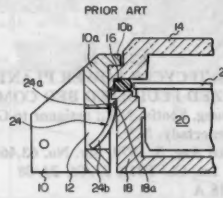
4,223,527

RETAINING SPRING FOR A WRISTWATCH CASE

Hidetaka Tutiya, Akishima, and Masahiko Waki, Tokorozawa, both of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1978, Ser. No. 950,775
Claims priority, application Japan, Oct. 13, 1977, 52-122743
Int. Cl.[3] **G04B** *37/04;* **F16B** *7/20, 13/00*
U.S. Cl. 368—283 **12 Claims**

1. A wristwatch case comprising:
a case band;
a back cover disposed in said case band;
a watch glass held in place by said case band and said back cover; and
a retaining spring disposed between said case band and said back cover for fixedly retaining said case band an said back cover relative to each other;
said retaining spring comprising an engaging portion engaging with both of said case band and said back cover to fixedly retain said case band and said back cover relative to one another, first and second torsionable portions horizontally extending from both ends of said engaging portion and first and second fixing portions integrally connected to said first and second torsionable portions, respectively; said first and second fixing portions being fixedly retained in one of said case band and said back



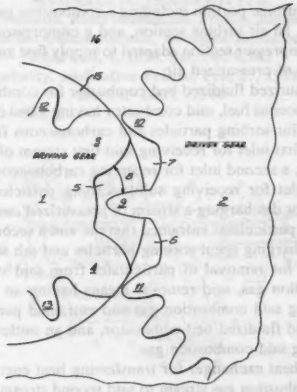
cover, said first and second torsionable portions including weakened portions serving as springs, respectively, and said first and second fixing portions being aligned on the same horizontal plane as said engaging portion, to allow rotation of said engaging portion at a predetermined angle relative to the plane of each of said first and second fixing portions, whereby said engaging portion is movable to a position to allow removal of said case band and said back cover relative to each other.

4,223,528

UNIDIRECTIONAL GEAR TRANSMISSION

Cyril Vuilleumier, Bienne, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services, S.A., Bienne, Switzerland

Filed Oct. 31, 1978, Ser. No. 956,525
Int. Cl.[3] **G04B** *19/02;* **G04C** *3/00;* **F16H** *55/06, 55/17*
U.S. Cl. 368—220 **7 Claims**



1. A unidirectional gear transmission comprising a driving gear and a driven gear, the driving gear being rotated in predetermined fixed steps and being provided with at least one first set of driving teeth of a first thickness separated by a first tooth space and at least one second set of two driving teeth of a second and greater thickness separated by a second and greater tooth space, said first and second sets being alternately arranged about the driving gear, and the driven gear being provided with teeth separated by an appropriate space adapted to mesh with, and be driven by, said driving gear teeth of said first thickness, but having at least one set of two greater tooth spaces on said driven gear, greater in size than said appropriate

space, adapted to mesh with, and be driven by, said teeth of greater thickness whereby stepwise transmission of rotation from said driving gear to said driven gear may be realised in both rotation senses and transmission of rotation from said driven gear to said driving gear between steps is prevented by butting of teeth of said driven gear against teeth of greater thickness of said driving gear.

4,223,529

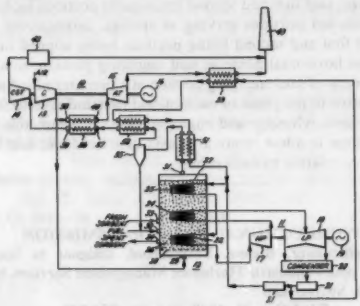
COMBINED CYCLE POWER PLANT WITH PRESSURIZED FLUIDIZED BED COMBUSTOR

David M. Willyoung, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 3, 1979, Ser. No. 63,469

Int. Cl.³ F01K *23/06, 23/08*

U.S. Cl. 60—39.18 A **9 Claims**



1. A combined cycle power plant, comprising:

(a) a gas turbine portion including a combustion gas turbine section, an air turbine section, and a compressor section, said compressor section adapted to supply first and second streams of pressurized air;

(b) a pressurized fluidized bed combustor for combustion of carbonaceous fuel, said combustor having a bed of fluidizable sulfur-sorbing particles and carbonaceous fuel particles, a first inlet for receiving said first stream of pressurized air, a second inlet for receiving carbonaceous fuel, a third inlet for receiving sulfur-sorbing particles, a first outlet for discharging a stream of pressurized combustion gas and particulates entrained therein, and a second outlet for discharging spent sorbing particles and ash solids;

(c) means for removal of particulates from said stream of combustion gas, said removal means having an inlet for receiving said combustion gas and entrained particulates from said fluidized bed combustor, and an outlet for discharging said combustion gas;

(d) a first heat exchanger for transferring heat energy from said combustion gas stream to said second stream of pressurized air, said heat exchanger having a first inlet for receiving said combustion gas stream from said particulate removal means, a second inlet for receiving said second stream of pressurized air, a first outlet fluidly connected to said combustion gas turbine for discharging said combustion gas stream thereto as motive fluid therefor, and a second outlet fluidly connected to said air turbine for discharging said second stream of pressurized air thereto as motive fluid therefor;

(e) a steam turbine; and

(f) steam generating means in said fluidized bed combustor for furnishing steam to drive said steam turbine.

4,223,530

LIQUID FUEL ROCKET ENGINE HAVING A PROPELLANT COMPONENT PUMP TURBINE WITH A SECONDARY THRUST DISCHARGE AND TO A METHOD OF OPERATING A LIQUID FUEL ROCKET ENGINE

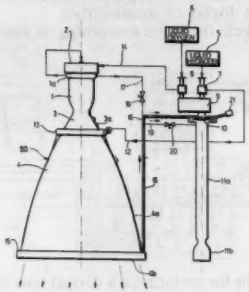
Erich Kirner, Bernaysstr. 42, 8000 München 45, and Helmut Dederra, Mozartstr. 87a, 8012 Ottobrunn, both of Fed. Rep. of Germany

Filed Sep. 22, 1978, Ser. No. 944,750

Claims priority, application Fed. Rep. of Germany, Sep. 30, 1977, 2743983

Int. Cl.² F02K *9/02*

U.S. Cl. 60—204 **11 Claims**



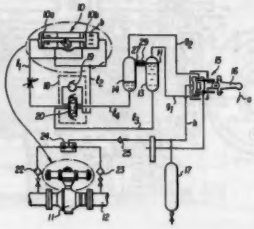
1. A liquid fuel rocket engine for operation in outer space, comprising, wall means defining a combustion chamber having an injection head and with a thrust nozzle part having a narrow neck portion, an initial expanding portion having an expansion of substantially ground pressure and a vacuum expanding portion connected to said initial expanding portion and terminating in a thrust discharge, each of said combustion chamber, said initial expansion portion and said final expanding portion having walls with cooling channels extending therethrough for the circulation of a propellant component therethrough, a propellant component pump gas turbine, first and second propellant component pumps connected to said gas turbine for operation thereby, a first propellant component supply tank connected to said first propellant component pump, a second propellant component supply tank connected to said second propellant component pump, a secondary flow nozzle connected to said turbine for the discharge of the turbine exhaust gases, a distributor ring connected to the cooling channels of said initial expansion portion and said final expansion portion for circulating a first portion of said second propellant component to the cooling channels of said initial expansion portion, and a second portion of said second propellant component to the cooling channels of said second expansion portion, a first collecting ring connected to said final expansion portion and disposed adjacent said discharge, a second circulating line connected to said second propellant component pump and said distributor ring for supplying a second propellant component to said distributor ring, a second collecting ring connected to said cooling channels of said initial expanding portion and disposed adjacent said head, and a first connection line from said collecting ring to said turbine for directing a portion of said second propellant component gases to said turbine after they have been heated in the cooling channels of said final expansion portion.

4,223,531

GAS PRESSURE TO HYDRAULIC PRESSURE CONVERTER SYSTEM IN AN OIL PRESSURE ACTUATOR

Akio Fukunaga, Kakogawa, and Toshio Nakane, Akashi, both of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Filed Apr. 3, 1979, Ser. No. 26,546
Claims priority, application Japan, Apr. 3, 1978, 53-39531
Int. Cl.³ F15B *1/02*
U.S. Cl. 60—400 **4 Claims**



1. In a gas pressure to hydraulic pressure converter system for use in powering an actuator, wherein a means for supplying pressurized gas is connected with control valve means to control supply and exhaust of pressurized gas to and from first and second gas-to-hydraulic reservoirs partially filled with hydraulic fluid and each being connected with the actuator to operate the actuator in respectively opposite directions when gas pressure is supplied to a respective one of the reservoirs by appropriate operation of the control valve means, the improvement comprising:

a conduit connected between the reservoirs at the location of desired maximum hydraulic fluid level therein;

a valve body connected at opposite ends thereof in the conduit and having a valve seat at each end thereof;

a valve member reciprocable in the body between the seats; and

biasing means urging the valve member to a neutral position between and spaced from the seats, the valve member being movable toward one reservoir and into contact with one of the seats when pressure in the other reservoir exceeds the force of the biasing means to thus prevent loss of pressure from one reservoir to the other during actuation, and the valve member assuming its neutral position when gas pressure between the reservoirs is equal to enable flow of hydraulic fluid from one reservoir to the other when the level of hydraulic fluid in said one reservoir reaches the predetermined maximum level.

4,223,532

AUTOMOTIVE ENERGY MANAGEMENT SYSTEM

Samuel Shiber, P.O. Box 371, Mundelein, Ill. 60060

Continuation-in-part of Ser. No. 9,673, Feb. 5, 1979, and a continuation-in-part of Ser. No. 9,674, Feb. 5, 1979, which is a continuation-in-part of Ser. No. 875,731, Feb. 6, 1978, Pat. No. 4,175,389. This application Aug. 2, 1979, Ser. No. 63,144
Int. Cl.³ F16D *31/02*
U.S. Cl. 60—414 **17 Claims**

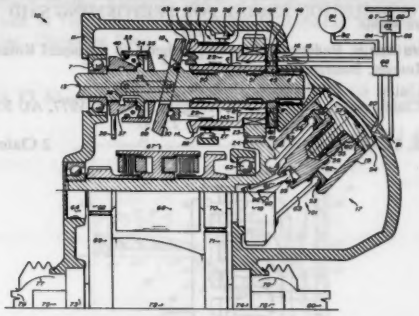
1. An automotive energy management system comprising in combination:

a housing,

a first hydraulic unit having a first input/output member, a first reaction member, a first inlet port and a first outlet port,

a second hydraulic unit having a second input/output member, a second reaction member which is coupled to said housing for obtaining therefrom an external reaction to torque developed in said second hydraulic unit, a second inlet port and a second outlet port,

clutch means for selectively coupling said first reaction member to said second input/output member, and,



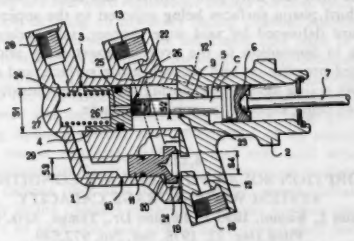
brake means for selectively anchoring said first reaction member to said housing.

4,223,533

DEVICE FOR THE POWER-ASSISTED CONTROL OF A HYDRAULIC TRANSMITTER

M. Daniel Valentin, Rueil Malmaison, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Feb. 1, 1979, Ser. No. 8,783
Claims priority, application France, Feb. 27, 1978, 78 05486
Int. Cl.³ B60T *13/00*
U.S. Cl. 60—547 R **6 Claims**



1. A device for the power-assisted control of a hydraulic transmitter comprising:

a transmitter cylinder having a first and second bore provided therein;

a main piston including a bore hole, disposed in said cylinder;

valve means disposed in the bore of the cylinder;

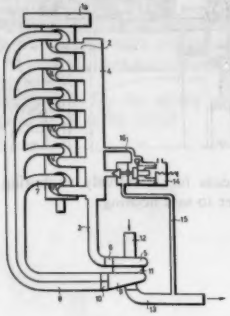
a fluid source communicating with said cylinder; and,

a control piston movably disposed in said second bore and having a control section and a second section and wherein the control section of the control piston is larger than the second section of said control piston.

4,223,534
PROCESS FOR TURBOCHARGING INTERNAL COMBUSTION ENGINES FOR HIGH ALTITUDE OPERATION AND THE TURBOCHARGED INTERNAL COMBUSTION ENGINE FOR PERFORMING SAID PROCESS

Imre Annus, Budapest, Hungary, assignor to Autoipari Kutato Intezet, Budapest, Hungary

Filed Feb. 2, 1978, Ser. No. 874,476
Claims priority, application Hungary, Feb. 14, 1977, AU 372
Int. Cl.³ F02B *37/00*
U.S. Cl. 60—611 **2 Claims**



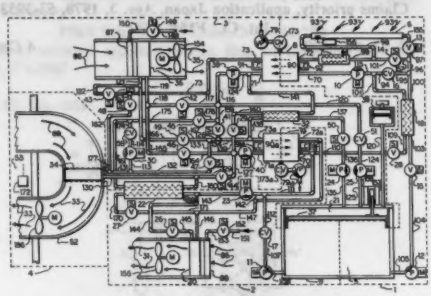
1. In combination, an internal combustion engine and a turbocompressor driven by exhaust gases from the engine to feed compressed air to the engine, means for passing all of the air from the turbocompressor passing to the engine when the engine is at the highest altitude for which the engine was designed and is operating at full load and is running at its lowest normal operating speed, and valve means responsive to at least one of lower altitude and higher engine speed and less than full engine load automatically to discharge some of the air compressed by the turbocompressor, said valve comprising a valve housing (**24**) and a valve member (**25**) disposed in said valve housing, spring means (**34**) normally urging said valve toward closed position, said valve member having three piston surfaces thereon, a first one (**32***a*) of which is exposed to the atmosphere, and second and third ones (**30***a*, **30***b*) of which face in opposite directions, said second piston surface being larger in area than said third piston surface and both of said second and third piston surfaces being exposed to the supercharged pressure delivered by said supercharger, said spring means acting in opposition to the pressure exerted by said supercharged pressure on said second piston surface, and a sealed bellows acting against said spring means, the outside of said bellows being exposed to ambient pressure.

4,223,535
ABSORPTION SOLAR POWERED AIR CONDITIONING SYSTEM WITH STORAGE CAPACITY

Emerson L. Kumm, 1035 E. Laguna Dr., Tempe, Ariz. 85282

Filed Dec. 22, 1978, Ser. No. 972,539
Int. Cl.³ F25B *27/00, 15/00*
U.S. Cl. 62—2 **7 Claims**

1. A water vapor absorption system for use in heating and cooling the air of an enclosure comprising:
(a) a strong salt solution;
(b) a weak salt solution;
(c) storage means for containing and segregating said strong solution and weak solution;
(d) first and second vapor exchangers each comprising a casing, sealed except for means for ingress and egress of said solutions, a plurality of vertical, perforated structures containing elements having a large wetted area per unit volume, means for positioning said structures in close but insulating proximity to each other, means for producing a partial vacuum in said casing, whereby when said strong and weak solutions are introduced to adjacent ones of said structures in concurrent flow, vapor exchange occurs between said strong and weak solutions through the walls of adjacent ones of said structures;
(e) adjustment means for selectively adjusting the temperatures of the strong and weak solutions at selected points in the system other than said vapor exchanger;

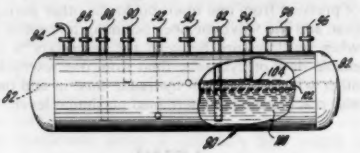


(f) air enclosure heat exchange means; and
(g) transportation means, operatively connecting said storage means, adjustment means, vapor exchangers, and air enclosure heat exchanger for selectively routing said strong and weak solutions there among.

4,223,536
CRYOTHERMAL MANIPULATION OF PETROLEUM

Sigmund L. Ross, New York, N.Y.; Oscar Shuffman, deceased, late of Scarsdale, N.Y., and Rose Shuffman, executrix, 1 Cornell St., Scarsdale, N.Y. 10583, assignors to Rose Shuffman, executrix, Scarsdale, N.Y., executrix of Oscar Shuffman

Division of Ser. No. 918,586, Jun. 23, 1978, which is a division of Ser. No. 762,657, Jan. 26, 1977, Pat. No. 4,129,431, which is a division of Ser. No. 246,960, Apr. 24, 1972, Pat. No. 4,031,707.
This application Feb. 16, 1979, Ser. No. 12,797
Int. Cl.³ F17C *7/02*
U.S. Cl. 62—45 **1 Claim**



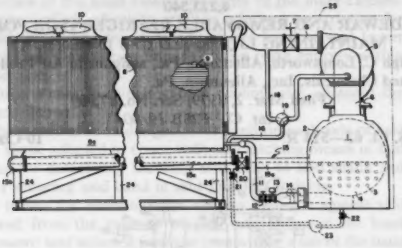
1. Apparatus for pre-refining a body of crude petroleum oil, comprising
a container having a screen therein disposed horizontally at an intermediate level of the container depth,
inlet pipes for respectively introducing into said container water, petroleum oil and a mass of material at a cryothermal temperature which corresponds to the freezing point of water at sea level or lower and which is lower than the temperature of the oil,
means provided in said container for heating the substances therein,
outlet pipes for separately removing oil and water as they exist in said container above and below said screen, respectively
and an outlet pipe for removing cryothermal material from said container.

4,223,537

AIR COOLED CENTRIFUGAL WATER CHILLER WITH REFRIGERANT STORAGE MEANS

Duane F. Sanborn, and Chester D. Ware, both of La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Dec. 22, 1978, Ser. No. 972,313
Int. Cl.[3] F25B *39/04, 41/00*
U.S. Cl. 62—174 11 Claims



1. A refrigeration system comprising

a. evaporator means comprising a shell for containing a quantity of liquid refrigerant and including a plurality of tubes passing therethrough in heat exchange relationship with said refrigerant, whereby a heat exchange medium may be passed through said tubes and chilled through vaporization of said refrigerant, thereby producing a relatively low pressure vaporized refrigerant;

b. centrifugal compressor means connected to said evaporator means for receiving said relatively low pressure vaporized refrigerant and compressing same, thereby producing a relatively high pressure vaporized refrigerant;

c. air cooled condenser means connected to said centrifugal compressor means via first conduit means for receiving said relatively high pressure vaporized refrigerant and condensing same by heat exchange with a source of air, said air cooled condenser means comprising an elongated assembly including a plurality of finned tubes within which said refrigerant condenses and over which said air passes in heat exchange relationship, said elongated assembly being disposed adjacent said evaporator means and extending therefrom along a longitudinal axis; the capacity of said air cooled condenser means being selectively reduced under predetermined operating conditions through the flooding of said tubes with condensed refrigerant to thereby reduce their heat exchange capacity;

d. second conduit means for passing condensed refrigerant from said air cooled condenser means to said evaporator means, including expansion means for reducing the pressure of said condensed refrigerant prior to its admission to said evaporator means; and

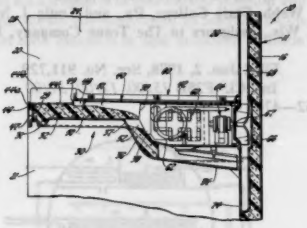
e. a liquid refrigerant storage vessel in communication with the shell of said evaporator means for receiving therefrom and storing excess liquid refrigerant during those operating conditions when such refrigerant is not required in order to flood and thereby reduce the capacity of said air cooled condenser means as recited in paragraph (c.) and for returning same to the refrigeration system when so required, said refrigerant storage vessel comprising an elongated pipe member connected at one end to said shell and extending therefrom along an axis generally parallel to said longitudinal axis and adjacent said air cooled condenser means.

4,223,538

REFRIGERATOR COMPARTMENT DIVIDER MOUNTING

Ralph S. Braden, Bellbrook, and Paul E. Kronenberger, Dayton, both of Ohio, assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jan. 23, 1979, Ser. No. 5,861
Int. Cl.[2] F25D *11/00*
U.S. Cl. 62—443 1 Claim



1. In combination with a refrigerator cabinet having an outer shell member, a substantially box-like liner nested substantially within said shell member providing rear, side, bottom and top walls defining a food storage chamber, a laterally extending partition assembly within said chamber dividing said chamber into an upper compartment and a lower compartment, said partition assembly including a bottom supporting wall means, said bottom supporting wall means defining with said refrigerator liner rear and side walls a refrigeration system components cavity accessible via an upper access opening, and a closure for the access opening of said cavity including a planar shelf portion adapted to support food in said upper compartment and a forward portion overlying said partition assembly and engageable therewith for retaining said closure adjacent thereto in closing relationship to said cavity, the improvement wherein said shelf portion is supported by a support frame assembly in a slidably removable manner for closing said cavity access opening, said support frame assembly having three sections, the three sections of said support frame assembly being a pair of elongated mirror image first and second side wall sections and a third rear wall section, said first and second side wall sections each having a length substantially coextensive with a longitudinal side dimension of said shelf portion and terminating in a rearward right-angle corner portion, each side wall section defining an inwardly facing channel adapted to slidably receive and support the associated side edge of said shelf portion, means defining a forwardly facing channel extending throughout the length of said rear wall section adapted to receive the rear edge of said shelf portion, said side sections and said rear wall section each having securing flange portions extending upwardly from the upper edge of its associated channel, means engaging said side and rear wall securing flange portions for fixedly retaining said sections to their respective cabinet liner side and rear walls, means defining a forwardly facing channel in each said corner portion adapted to receive an associated rear corner edge of said shelf portion, said rear wall section having a predetermined length such that the free ends thereof are positioned in opposed spaced relation with the inwardly facing free ends of their associated corner portions defining an adjustment gap at each end of said rear wall section, whereby liners of varying interior tolerance dimensions between their side walls may be adjustably accommodated by the gaps of said support frame assembly; one of said wall section flange portions including a wing extending beyond the free end of the section, whereby said section wing telescopically overlaps a portion of the securing flange portion of an adjacent section so as to conceal any gap at said free end due to such adjustable accommodation, the forward portion of said closure being deformable to permit disengagement thereof from said partition assembly to enable the side and rear edges of said shelf portion to be free for sliding movement relative to

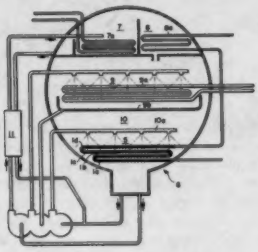
said frame assembly, thereby permitting said closure to be removed from said cabinet allowing ready accessibility to said cavity via said access opening for servicing components therewithin without the supporting frame or sections thereof having to be removed.

4,223,539

APPARATUS FOR ABSORBING A VAPOR IN A LIQUID AND ABSORPTION REFRIGERATION SYSTEM INCORPORATING SAME

Ralph L. Webb, State College, Pa., and Louis J. Mougin, La Crosse, Wis., assignors to The Trane Company, La Crosse, Wis.

Filed Jun. 2, 1978, Ser. No. 911,729
Int. Cl.³ F25B *15/00, 17/00, 37/00*
U.S. Cl. 62—476 **21 Claims**



1. An absorption refrigeration system of the type utilizng a liquid absorbent solution and a refrigerant, and further including an additive for increasing the performance thereof, said system comprising

a. generator means for vaporizing refrigerant from said absorbent solution and thereby concentrating same;

b. condenser means connected to said generator means for receiving high pressure refrigerant vapor therefrom and condensing same;

c. evaporator means connected to said condenser means for receiving condensed refrigerant and vaporizing same in heat exchange with a refrigeration load;

d. absorber means connected to said generator means for receiving concentrated absorbent solution and to said evaportor means for receiving refrigerant vapor and absorbing same in said concentrated absorbent solution to thereby produce dilute absorption solution, said additive existing within said absorber means in at least a vapor phase in admixture with said refrigerant vapor, thereby forming a vapor mixture, and being effective to reduce the surface tension of the absobent solution upon contact therewith, said absorber means including

i. a plurality of heat transfer members each having a first surface and a second surface;

ii. means for passing a heat transfer fluid in heat transfer relationship with said second surfaces;

iii. means for passing said concentrated absorbent solution in heat transfer relationship with said first surfaces such that a film of absorbent solution is formed thereon, whereby heat may be transferred from said absorbent solution, through said heat transfer members, to said heat transfer fluid;

iv. means for bringing said vapor mixture into direct contact with absorbent solution which is in heat transfer relationship with said first surfaces; and

v. a plurality of protuberances extending outwardly from said respective first surfaces and spaced from one another so as to define a two dimensional arrangement of protuberances along said respective first surfaces, said protuberances being of a size and shape such that the film of absorbent solution flows therebetween over said first surface, said protuberances having a height substantially equal to the thickness of the film of absorbent solution formed on said respective first surfaces and being spaced from one another along said respective first surfaces by a dimension equal to from about 3 to 7 times their height; and

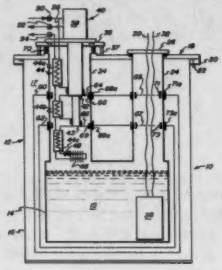
e. pump means connected to said absorber means and said generator means for returning dilute absorption solution from said absorber means to said generator means.

4,223,540

DEWAR AND REMOVABLE REFRIGERATOR FOR MAINTAINING LIQUEFIED GAS INVENTORY

Ralph C. Longsworth, Allentown, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 2, 1979, Ser. No. 17,009
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **10 Claims**



1. A Cryostat comprising in combination:

a vacuum jacketed reservoir for receiving and holding a supply of liquid cryogen including at least one means for access to said liquid cryogen from outside said reservoir;

means in said vacuum jacket and said access means to intercept heat infiltrating into said reservoir; and

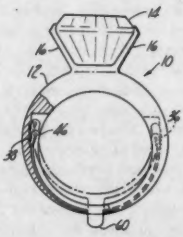
refrigeration means to maintain said heat intercepting means at a temperature between that of the liquid cryogen and ambient and recondense liquid cryogen boil-off from said reservoir.

4,223,541

RING WITH INTERNAL MEANS FOR VARYING SIZE

Luis M. Martinez, 23871 W. LeBost Dr., Novi, Mich. 48050

Filed Jun. 15, 1978, Ser. No. 916,011
Int. Cl.³ A44C *9/02*
U.S. Cl. 63—15.6 **11 Claims**



1. An ornamental finger ring comprising a setting,

a generally circular primary shank having an inwardly opening slot recessed in the inner wall thereof and spaced from the exterior surface thereof,

means opposite the bight of said shank for securing said setting on said shank,

said slot extending around the bight portion of said shank and terminating adjacent said setting on each side thereof and having an externally opening tab slot therein located opposite said setting,

a U-shaped adjustment band adapted to fit in said slot in said primary shank for movement therein between a lower position to effect a maximum finger opening for the ring and a selected upper position whereat the bight of the band is spaced inwardly of the ring from the bottom of the inwardly opening slot and whereat portions of the inner surface of the band extend inwardly of the inner circumference of said shank to provide a desired constriction for said finger opening, said adjustment band at said lower position of maximum finger opening lying entirely within said slot,

latching means in said inwardly opening slot adjacent the ends thereof,

latching means on said adjustment band on each side of said U shape adapted to coact with said latching means in said slot for detachably securing said band to said shank and for securing said band in said selected position,

and means for enabling the exertion of force against said band from the exterior of said ring to move the band toward said selected position comprising a tab of the band dimensioned to move radially through the tab slot beyond the adjacent outer surface of said shank when the band is below said selected upper position.

10. The combination in improved adjustment means for an ornamental finger ring comprising a generally U-shaped adjustment band adapted to yield resiliently for assembly within the inner circumference of the shank for the ring at a selected position spaced above the bight of the shank for restricting the finger opening and to be movable from the selected position toward said bight, the band having a latching member associated with a U-arm and located outwardly therefrom for resiliently engaging the latching means of the shank with outwardly directed force and releasably latching therewith when the band is assembled at the selected position, and means resiliently connecting the latching member with its associated U-arm for enabling limited inward yielding of the U-arm independently of the latching member when the latter resiliently engages the latching means of the shank.

4,223,542

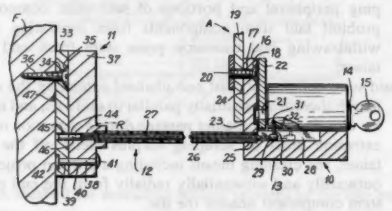
PILFER PREVENTION DEVICE

Mark T. Basseches, 420 Lexington Ave., New York, N.Y. 10017

Filed Apr. 23, 1979, Ser. No. 32,175

Int. Cl.³ E05B *73/00*

U.S. Cl. 70—58 **7 Claims**



1. Anti-pilferage device comprising a lock housing including a mounting portion having a mounting aperture, lock means on said housing shiftable between locking and unlocking positions, a cover member operatively connected to said locking means, said cover member being disposed in shielding position of said aperture in said locked position and in exposing position of said aperture in said unlocked position of said locking means, an elongate cable assembly having a first end fixed to said housing and having a free end, said assembly including an enclosed movable operator portion connected to said lock means and movable relative to other portions of said assembly responsive to movements of said lock means, an attachment fixture secured to said free end of said cable assembly, said fixture including a mounting plate having a mounting aperture formed therein, shutter means mounted on said fixture and shiftable between blocking and unblocking positions of said aperture, and shutter control means operatively associated with said operator portion of said cable assembly adjacent said free end for locking said shutter means in said blocking position when said lock means is in said locked position and releasing said shutter means for movement to said unblocking position when said lock means is in said unlocked position.

4,223,543

SMALL SIZE, PORTABLE BENDER

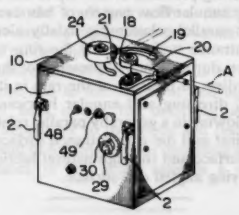
Kaneaki Sakamoto, Chigasaki, Japan, assignor to Kabushiki Kaisha Chuck Seisakusho, Kanagawa, Japan

Filed Mar. 2, 1979, Ser. No. 16,879

Claims priority, application Japan, Apr. 14, 1978, 53/48216; Sep. 4, 1978, 53/123852

Int. Cl.² B21D *7/024*

U.S. Cl. 72—30 **5 Claims**



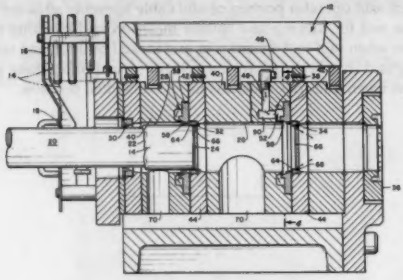
1. A portable bender having a case body which is small in both size and weight enough to permit transportation of said bender by the hands of a user, and therein comprising a miniature, single-phase commutator motor, a drive shaft, a series of reduction gears for transmitting a rotational drive force from said motor to said drive shaft, electromagnetic clutch means for connecting and disconnecting the transmission of said rotational drive force to said drive shaft, a stationary shaft disposed coaxially of said drive shaft to protrude through said case body, stopper block means for a member to be bent disposed on the outer surface of said case body to be spaced at a determined distance from said stationary shaft, a slot formed in said outer surface to be arcuately elongated around the center of said stationary shaft, a bending roller provided on said outer surface and so linked to said drive shaft as to be turned along said arcuately elongated slot for applying a bending force to a member to be bent, bending angle control means including means for setting a determined degree of bending angle and means for locking said setting means and being operable to cause said clutch means to diconnect said rotational drive force from said drive shaft when said drive shaft has turned to said determined degree of bending angle, means for returning said drive shaft to the initial position when said clutch means disconnects said rotational drive force, and counteracting means against said returning means to lower velocity of the returning movement of said drive shaft and said bending roller.

4,223,544

DIE LUBRICANT NOZZLE FOR USE IN CAN BODYMAKERS AND THE LIKE

Ralph M. Main, San Pedro, Calif., assignor to Standun, Inc., Compton, Calif.

Filed Sep. 2, 1975, Ser. No. 609,427
Int. Cl.[3] B21D 22/28
U.S. Cl. 72—45 12 Claims



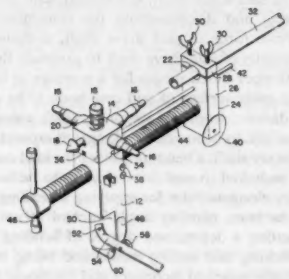
7. In a method of lubricating and cooling a die ring of the type forming a part of a tool pack of a can bodymaker and the like wherein a ram reciprocates in a die pack opening carrying a metallic cup on an end thereof axially through the die ring in a working metal forming stroke, the cup is stripped therefrom and the ram moves reversely through the die ring in a return stroke, the die ring in direction of the forming stroke having a radially inward angled entrance surface terminating at a forming surface followed by a radially outward angled exit surface; the steps of: during presence of the cup in the die ring, directing a generally annular flow pattern of lubricant continuously in a generally parallel relationship axially along and against said angled entrance surface of the die ring to said die ring forming surface; during a lack of presence of the cup in the die ring and regardless of position of the ram in its working and return strokes, directing said annular lubricant flow pattern continuously flowing in a generally parallel relationship axially along and against said die ring entrance surface over said die ring forming surface and through natural lubricant adherence along said die ring angled exit surface.

4,223,545

SWAGING TOOL ASSEMBLY

George T. Tucholski, R.D. #1, Box 364, Orwell, Ohio 44076

Filed May 19, 1978, Ser. No. 907,297
Int. Cl.[3] B21D 7/02, 41/02
U.S. Cl. 72—206 6 Claims



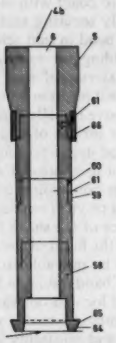
1. A swaging tool assembly, comprising, in combination, a tool support; a head rotatably mounted atop said support and having a plurality of flaring ends radiating therefrom; notches in said head below said ends; stops on said tool support; spring means urging said notches onto said stops; tube bending means on said tool support; a tube holding block carrying clamping means for clamping a tube in line with one of said flaring ends; screw means for advancing said block toward said tool support; cooperating tube guides on said support and tube cutting means on said block.

4,223,546

EXTRUSION PRESS STEM WITH AT LEAST ONE CHANNEL RUNNING APPROXIMATELY AXIALLY THROUGH IT

Alfred Wagner, Steisslingen, and Adolf Ames, Hilzingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Continuation of Ser. No. 676,744, Apr. 14, 1976, abandoned.
This application Jul. 17, 1978, Ser. No. 925,098
Claims priority, application Fed. Rep. of Germany, May 2, 1975, 2519766
Int. Cl.[3] B21C 25/00, 35/06, 25/10
U.S. Cl. 72—253 A 7 Claims



1. An extrusion press stem having an axis, said stem having a die mounted thereon at one end thereof for use in the indirect extrusion of a light metal billet, and adapted to fit tightly into a passage of a container, comprising, in combination:

a plurality of stem components being disposed in adjoining series arrangement along said axis, the end portion of each of said stem components near said die has an increased inside diameter and the other end has a reduced outside diameter whereby said other end of said stem components is telescopically received in said end portion of said adjoining component such as said stem components are interconnected tightly but releasably by their adjacent concentric peripheral end portions whereby the overlapping peripheral end portions of said stem components prohibit said stem components from separating when withdrawing said extrusion press stem from said container;

said stem defining at least one channel extending the entire length thereof substantially parallel to said axis, and means for cleaning the container passage during operation of said extrusion press by scraping surplus metal off the container, the cleaning means including a portion projecting outwardly and substantially radially from the end of the stem component nearest the die.

4,223,547

METHOD OF HOLE FORMING

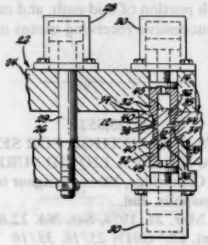
Elliot J. Epner, Huron, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 11, 1978, Ser. No. 968,102
Int. Cl.[3] B21C 23/18; B21D 28/10
U.S. Cl. 72—254 5 Claims

1. A dieless method of hot forming a hole in a part of substantial thickness comprising:

heating the part to substantially reduce the hardness thereof throughout the zone in which the hole is to be formed,

relatively moving a pair of tools to engage opposite sides of the part at the heated zone and to displace and extrude material from the heated zone from at least one side of the part into an axially extending opening in at least one of



said tools to define an annular axially extending groove having a depth which leaves an integral annular wall section intermediate the sides thereof having a thickness substantially less than that of the part, and

separating the annular wall section from the part to complete the formation of a hole through the part.

4,223,548

PROCESS AND DEVICE FOR EXTRUDING HOLLOW SECTIONS

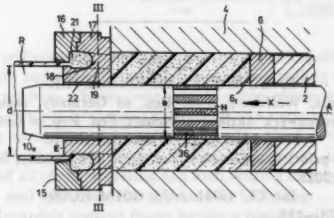
Alfred Wagner, Steisslingen, and Adolf Ames, Hilzingen, both of Fed. Rep. of Germany, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Mar. 14, 1979, Ser. No. 20,253

Claims priority, application Fed. Rep. of Germany, Mar. 23, 1978, 2812690

Int. Cl.³ B21C *23/01, 25/00, 29/04, 31/00*

U.S. Cl. 72—265 **20 Claims**



1. A method for extruding hollow sections or the like comprising:

loading a hollow billet into a container;

locating an extrusion tool comprising a die, a hollow mandrel and a mandrel support at the end of said container such that said die surrounds said hollow mandrel;

moving a hollow stem in a first direction into said container from the opposite end thereof so as to urge said billet through said die so as to form said hollow section; and

passing a core through said stem, said hollow billet and said hollow mandrel thereby reducing the high stresses on said hollow mandrel and said mandrel support.

4,223,549

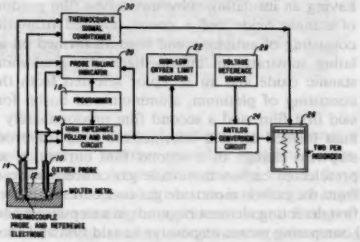
OXYGEN MONITORING CIRCUIT WITH BUILT IN TESTING MEANS

Frank Kitzinger, Montreal, Canada, assignor to Noranda Mines Limited, Toronto, Canada

Filed Feb. 16, 1979, Ser. No. 12,818

Int. Cl.³ G01N *27/28*

U.S. Cl. 73—1 R **10 Claims**



1. An oxygen monitoring circuit adapted for connection to an oxygen probe immersed in molten metal comprising:

(a) a high impedance follow and hold circuit adapted for connection to the oxygen probe;

(b) a readout unit connected to the high impedance follow and hold circuit;

(c) a programmer normally connecting said oxygen probe to said high impedance follow and hold circuit but momentarily disconnecting the oxygen probe from said high impedance follow and hold circuit for a relatively short time interval and loading it with a resistor having an impedance relatively higher than the normal impedance of the oxygen probe; and

(d) a probe failure indicator connected to the output of said oxygen probe and to the output of said high impedance follow and hold circuit for detecting any significant change in impedance of the probe and resistor combination as a result of loading and for operating an alarm when the impedance of the probe exceeds a predetermined value.

4,223,550

CARBON MONOXIDE DETECTING APPARATUS

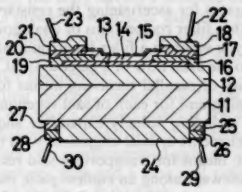
Teizo Takahama; Toyoki Kazama, and Tatumi Hieda, all of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 25, 1978, Ser. No. 928,031

Claims priority, application Japan, Jul. 26, 1977, 52-89408

Int. Cl.² G01N *27/04*

U.S. Cl. 73—23 **6 Claims**



1. A carbon monoxide gas detecting apparatus adjusted to respond to a preselected range of carbon monoxide gas concentrations and comprising:

(a) a first carbon monoxide gas detecting element means having an insulating substrate, a first film predominantly of stannic oxide and a donor selected from the group

consisting of antimony and bismuth formed on said insulating substrate, an intermediate film predominately of stannic oxide and an acceptor selected from the group consisting of platinum, aluminum and boron formed on said first film, and a second film predominately of platinum formed on said intermediate film, for producing a stepwise change in a first film current at a first preselected carbon monoxide gas concentration;

(b) a second carbon monoxide gas detecting element means having an insulating substrate, a first film predominantly of stannic oxide and a donor selected from the group consisting of antimony and bismuth formed on said insulating substrate, an intermediate film predominately of stannic oxide and an acceptor selected from the group consisting of platinum, aluminum and boron formed on said first film, and a second film predominately of platinum formed on said intermediate film, for producing a stepwise change in a second film current at a second preselected carbon monoxide gas concentration different from the carbon monoxide gas concentration at which the first detecting element responds in a stepwise manner; and,

(c) comparing means responsive to said first and second film currents for providing a difference voltage signal having an amplitude which varies in response to the absolute value of the difference between said first film current and said second film current.

4,223,551

APPARATUS FOR ASCERTAINING THE RESISTANCE OF CIGARETTES OR THE LIKE TO AXIAL FLOW OF GASES THERETHROUGH

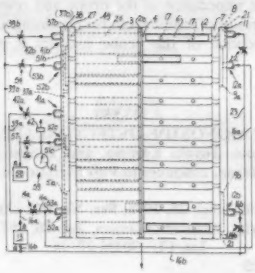
Heinz Greve, Hamburg, and Günter Wahle, Reinbek, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co., KG, Hamburg, Fed. Rep. of Germany

Filed Mar. 26, 1979, Ser. No. 24,180

Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813315

Int. Cl.³ G01N *15/08*

U.S. Cl. 73—38 **20 Claims**



1. In an apparatus for ascertaining the resistance which the fillers of cigarettes, filter rod sections or analogous rod-shaped articles of the type wherein a filler is surrounded by a tubular wrapper offer to the axial flow of a gaseous fluid, the combination of a plurality of parallel receiving means for rod-shaped articles; a confining unit for each of said receiving means, said confining units including radially expansible and contractible tubular sealing elements in axial alignment with the respective receiving means; means for transporting said receiving means and said units sideways along an endless path; means for feeding articles into successive receiving means in a first portion of said path; means for transferring articles from successive receiving means into the respective sealing elements in a second portion of said path, including means for establishing a pressure differential between the axial ends of articles in said second portion of said path; means for contracting successive sealing elements into sealing engagement with the wrappers of articles therewithin in a third portion of said path; means for conveying said fluid axially through the fillers of articles in successive contracted sealing elements in a fourth portion of said path; means for expanding successive sealing elements in a fifth portion of said path; means for transferring articles from successive expanded sealing elements into the respective receiving means in a sixth portion of said path, including means for establishing a pressure differential between the axial ends of articles in said sixth portion of said path; and means for accepting articles from successive receiving means in a seventh portion of said path.

4,223,552

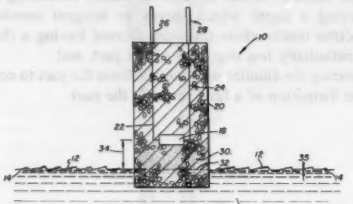
APPARATUS AND METHOD FOR SENSING A SUBSTANCE ON A LIQUID SURFACE

Sanders Goldstein, Cambridge, Mass., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Mar. 21, 1979, Ser. No. 22,622

Int. Cl.³ G01N *25/18, 33/18*

U.S. Cl. 73—61.1 R **11 Claims**



1. An apparatus for sensing a substance on a liquid surface comprising: at least one sensing element embedded in an absorbent material having a substantial affinity for said substance, said sensing element positioned in said material a predetermined distance from a reference point located in proximity to said liquid surface thereby establishing a threshold indicative of a known thickness of said substance, further comprising a plurality of sensing elements embedded in said material, said sensing elements being positioned in said material at various predetermined distances from said reference point thereby establishing a plurality of thresholds for measuring the thickness of said substance on said liquid surface.

4,223,553

ENGINE EFFICIENCY METER

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 8, 1979, Ser. No. 18,716

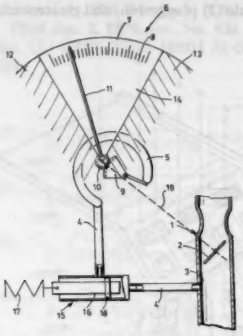
Claims priority, application Fed. Rep. of Germany, Mar. 18, 1978, 2812025

Int. Cl.³ G01L *3/26;* G01M *15/00*

U.S. Cl. 73—115 **1 Claim**

1. In an instrument for displaying an indication of the operating efficiency of a motor vehicle having a multiple speed transmission, said instrument including a pointer movable across an instrument face, the improvement wherein there is provided an opaque screen over said face, said screen being fixed relative to said instrument face and having a transparent window exposing a portion of said face corresponding to operating efficiencies of said vehicle while operating at constant speed, and wherein said face includes a scale calibrated to indicate operating efficiency when said transmission is in its highest speed, and wherein there is provided means for moving said pointer across said instrument face in response to engine intake vacuum pressure, and wherein there is provided fluid switch

means between the pointer moving means and the intake passage of the vehicle engine, for selectively establishing a connection to said means for moving said pointer only when said transmission is in its highest speed.

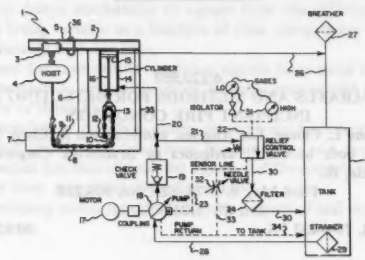


4,223,554

HOIST TEST STAND

Otmar M. Ulbing, Webster, N.Y., assignor to Columbus McKinnon Corporation, Tonawanda, N.Y.

Filed Jun. 7, 1979, Ser. No. 46,472
Int. Cl.³ G01L *3/00*; G01M *19/00*
U.S. Cl. 73—133 R **14 Claims**



1. A self-contained, portable test apparatus capable of dynamically and statically testing a tensioning, pulling or lifting device, such as a hoist, over a wide range of predetermined loads over a predetermined distance as to a variety of characteristics such as rated load, braking ability the functioning of overload safety mechanisms and generally every in service aspect of all of the operating and load bearing members of the device, said apparatus characterized by including:

(a) a portable support frame having a horizontally disposed structural beam member from which the device under test may be suspended, said beam member being supported by a vertically disposed column member which in turn is supported at its lower end by a base;

(b) a controllable variable power means suspended from said beam member for exerting a preselected load throughout the entire length of said predetermined distance; and

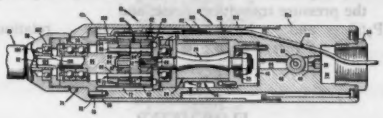
(c) means of variable, selectable mechanical advantage adapted to interconnect the device under test and said variable power means for transmitting a tension force therebetween, said tension transmitting means including a tension element, guide means on said base for guiding said element and a reeving device.

4,223,555

FASTENER TOOLS

Robert H. Alexander, Columbia, S.C., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Oct. 9, 1973, Ser. No. 404,689
Int. Cl.³ B25B *23/14*
U.S. Cl. 73—139 **15 Claims**



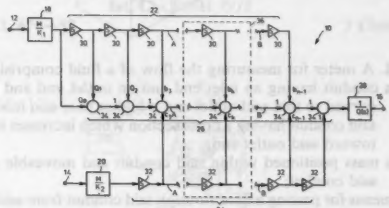
1. A fastener tightening tool, comprising: a housing; a fastener rotating output member rotatably supported from said housing; a motor and a drive train connected thereto for rotating said output member, said drive train including an angularly deflectable torque sensing component; means fixing a first portion of said torque sensing component against rotation in said housing over the entire range of reaction torque exerted on said component during a fastener tightening operation; and means for measuring the angular deflection of a second portion of said component during a fastener tightening operation to thereby provide a measure of the torque in which the fastener is tightened.

4,223,556

BODY MOTION COMPENSATION FILTER

Roger W. Hutchins, 148 Wimbleton Rd., Islington, Ontario, Canada

Filed Aug. 13, 1979, Ser. No. 65,780
Int. Cl.³ G01C *13/00, 23/00*
U.S. Cl. 73—179 **11 Claims**



1. A filter for use in determining the vertical displacement of a body travelling through water relative to a datum, the body having an accelerometer with a predetermined accelerometer gain that produces a signal indicative of the vertical acceleration of the body, the body having a pressure transducer with a predetermined pressure transducer gain that produces a position signal, corrupted by pressure transducer noise, indicative of the vertical displacement of the body with respect to the datum, the filter comprising:

(a) a first filter portion, connectable to the pressure transducer to produce a filtered position signal, the first filter portion having a transfer function which is substantially the product of a predetermined gain divided by the pressure transducer gain and a first real rational polynomial function of the form $P_1(s)/Q(s)$;

(b) a second filter portion, connectable to the accelerometer to produce a filtered acceleration signal, the second filter portion having a transfer function which is substantially the product of the predetermined gain divided by the accelerometer gain and a second real rational polynomial function of the form $sP_2(s)/Q(s)$; and,

(c) a first summer connected to the first and second filter

portions to produce a signal proportional to the sum of the first and second filter portion signals, where:

$P_1(s)$, $P_2(s)$ and $Q(s)$ are predetermined real polynomial functions in the complex variable s; p2 the degree of $Q(s)$ is an integer n greater than 2, and the degree of each of $P_1(s)$ and $P_2(s)$ is less than n;

the magnitude of $P_1(s)/Q(s)$ is less than 1 for $s=jw$ when w is any radial frequency within the frequency range of the pressure transducer noise; and

$P_1(s)$ and $P_2(s)$ satisfy the relationship $P_1(s)+S^3P_2(s)=Q(s)$.

4,223,557

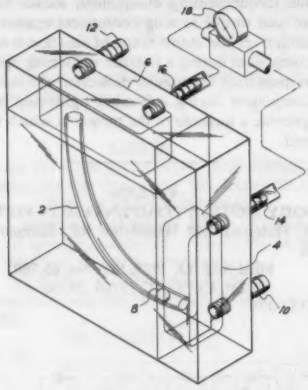
FLOWMETER

John A. Brinkman, Agoura, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 26, 1979, Ser. No. 23,810

Int. Cl.³ G01F *1/22, 1/36*

U.S. Cl. 73—861.55 **12 Claims**



1. A meter for measuring the flow of a fluid comprising:

a conduit having an inlet end and an outlet end and being curved so that said outlet end is higher than said inlet end, said conduit having a cross section which increases in area toward said outlet end;

a mass positioned within said conduit and moveable along said conduit;

means for passing a fluid through said conduit from said inlet end to said outlet end; and

means for measuring pressure differential between the fluid on both sides of said mass, whereby flow of fluid through said conduit is measured.

4,223,558

PIPETTING AND DILUTING APPARATUS

Paul Schmider; Herwig Mandl, and Dietmar Ihlefeldt, all of Munich, Fed. Rep. of Germany, assignors to Beckman Instruments, GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 863,751, Dec. 23, 1977, abandoned.

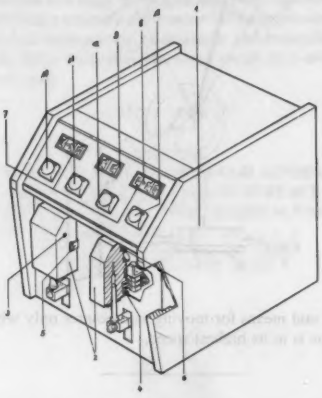
This application Nov. 24, 1978, Ser. No. 963,494

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1976, 2658486

Int. Cl.³ B01L *3/02*

U.S. Cl. 73—421 R **4 Claims**

1. Pipetting and diluting apparatus for dosages of small quantities of liquids with direct digital volume setting in milliliter or microliter units having 2 independent positive displacement pumps from which under insertion of suitable transmission means the pistons are driven by separate stepper motors being fed by an impulse generator, switching valves mounted at the head of pump cylinders and a calculating circuit as well as a comparator circuit, wherein the improvement comprises electronic calculating and comparator means for calculating automatically the piston stroke in dependence on the digital preselected quantity of liquid and the total volume capacity of the pump module (2) plugged-in, and electronic control means



for controlling the slope of start and stop characteristic of the piston motion according to a time base wherein the digital preselected piston speed and the total volume capacity of module (2) determine the period of acceleration and deceleration.

4,223,559

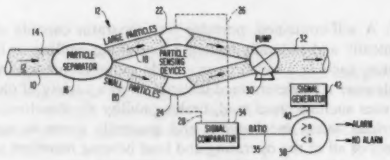
APPARATUS AND METHODS FOR DETECTING AN INCIPIENT FIRE CONDITION

Raymond L. Chuan, Los Angeles, and Houston D. Chen, Santa Ana, both of Calif., assignors to Brunswick Corporation, Skokie, Ill.

Filed May 9, 1978, Ser. No. 904,229

Int. Cl.³ G01N *15/02*

U.S. Cl. 73—432 PS **30 Claims**



1. An incipient fire detector comprising:

means defining a flow path for a fluid containing particulates generated by an incipient fire condition;

first means for sensing particulates of a first predetermined size flowing along the fluid flow path and providing a first output in response thereto;

second means for sensing particulates of a second predetermined size flowing along the fluid flow path and providing a second output in response thereto;

means coupled to said first sensing means and said second sensing means for providing a ratio of said first output and said second output; and

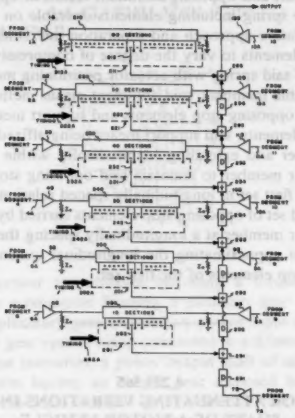
means for processing said ratio as an indication of an incipient fire condition.

4,223,560

VARIABLE DELAY SYSTEM

William E. Glenn, Fort Lauderdale, Fla., assignor to New York Institute of Technology, Old Westbury, N.Y.

Filed Jan. 2, 1979, Ser. No. 430
Int. Cl.[3] G01N *29/00*; H03H *19/00*
U.S. Cl. 73—626 58 Claims



1. A variable delay system for receiving signals from a plurality of elements and for producing a sum of the signals from said elements, the contributions to said sum from different elements being delayed with respect to each other, and the relative delays attributable to signals from the different elements being variable as a function of time, comprising:

a plurality of delay lines;

means for respectively applying signals from pairs of said elements to opposite ends of different ones of said plurality of delay lines;

a plurality of coupling means respectively associated with said plurality of delay lines for sampling, as a predetermined function of time, the signals at different delay stages of their associated delay lines; and

combining means for combining the outputs of said coupling means.

4,223,561

MOTION TRANSLATING MECHANISM

Benjamin G. Guerrero, Los Angeles, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Division of Ser. No. 761,377, Jan. 21, 1977, Pat. No. 4,126,960. This application Jul. 10, 1978, Ser. No. 922,892
Int. Cl.[2] F16H *21/44*, *25/18*
U.S. Cl. 74—105 5 Claims

1. In a mechanism for translating motion in a first direction to an output motion in a direction normal to said first direction, said mechanism comprising:

a first elongate generally bar-shaped member;

a second generally bar-shaped member slidably coupled to said first member; and

a deformable pressure plate means having one end thereof hingedly coupled to said first member and the other end thereof hingedly coupled to said second member, said first member, said second member and said pressure plate means being portions of a unitary generally rigid plastic member having integral reduced cross section hinge portions, said pressure plate means being normally biased away from the surface of said first member and operable

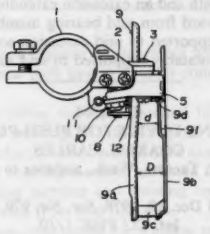
by a force thereon toward said surface whereby to move said second member relative to said first member.

4,223,562

FRONT DERAILLEUR FOR A BICYCLE

Masashi Nagano, Sakai; Hideaki Fujimoto, Toyonaka; Toshio Mizuno, and Tetufumi Egami, both of Sakai, all of Japan, assignors to Shimano Industrial Company, Limited, Osaka, Japan

Filed Feb. 12, 1979, Ser. No. 11,675
Claims priority, application Japan, Feb. 24, 1978, 53-23709[U]
Int. Cl.[2] F16H *7/18*
U.S. Cl. 474—82 3 Claims



1. A front derailleur for a bicycle for switching a driving chain to one of two chain sprockets of different diameters, said derailleur comprising:

a fixed member fixed to a bicycle frame;

a connecting member supported movably to said fixing member;

a chain guide supported to said connecting member and moving together therewith, said chain guide having two elongated oblong guide plates extending along the circumference of said chain sprockets, said two guide plates being opposite to each other and axial to said chain sprockets at an interval larger than the width of said driving chain, said interval being established by connecting means, the outer guide plate of both said guide plates being positioned axially outward to said chain sprocket and having a chain guide face positioned at a substantially intermediate position lengthwise and widthwise radially outward of each of said sprockets, said chain guide face

projecting toward said inner guide plate, said chain guide face and inner surface of said inner guide plate having a spacing slightly greater than the width of said driving chain and more narrowly than said interval.

4,223,563

MECHANISM FOR MOUNTING A SPEED CONTROL LEVER TO A BICYCLE

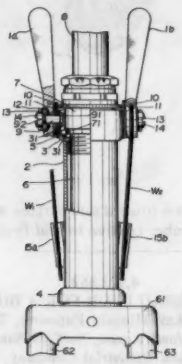
Masayoshi Kine, Osaka, Japan, assignor to Shimano Industrial Company, Limited, Osaka, Japan

Filed Dec. 13, 1978, Ser. No. 969,146

Claims priority, application Japan, Dec. 28, 1977, 52-177333

Int. Cl.[2] G05G *5/18*; B62K *23/06*

U.S. Cl. 74—501 R **7 Claims**



1. A mounting mechanism for mounting a speed control lever to a bicycle, comprising a pair of bearing members which are fixed to a head pipe of the bicycle and supporting a fork stem rotatable therewith, and a support member which rotatably supports said speed control lever, at least one of said bearing members having a ball race carrying balls which bear said fork stem therewith and an extension extending from said ball race axially outward from said bearing member, said support member being supported to said extension so that said speed control lever is rotatably supported to said support member.

4,223,564

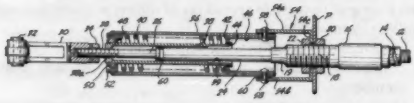
SELF CENTERING DEVICE FOR PUSH-PULL CONTROL COAXIAL CABLES

Harry E. Fawcett, Tacoma, Wash., assignor to Cablecraft, Inc., Tacoma, Wash.

Filed Dec. 18, 1978, Ser. No. 970,187

Int. Cl.[2] F16C *1/10*

U.S. Cl. 74—501 R **15 Claims**



1. In combination with a push-pull coaxial cable mechanism adapted to move an actuatable device reversibly through a range between opposite extreme positions, which range includes an intermediate neutral position, said cable mechanism including an inner core cable member slidably received within an outer tubular guide cable member, and a cable mechanism terminal assembly including an outer mounting fixture terminating said outer cable member and a device actuator rod terminating said inner cable member and projecting reciprocatively through said mounting fixture by distances beyond said mounting fixture that vary with relative longitudinal movement between the cable members;

neutral position return spring mechanism for said cable mechanism including an elongated outer tubular member surrounding said rod and interconnected with said mounting fixture, an elongated helical spring surrounding said rod and extending longitudinally within said outer tubular member, and opposing abutment means at opposite ends of the spring including elements operable on said spring by relative approach and separation movement between said elements to vary the degree of compressive shortening of said spring with actuator positioning movement of the cable members, said abutment means including a first set of opposing stop elements and support means for said stop elements, said support means being affixed to the rod member and extending longitudinally within said outer tubular member to maintain said opposing stop elements of the first set in longitudinally spaced relationship, and a second set of opposing stop elements carried by said outer tubular member at a longitudinally spacing therebetween at least approximating the longitudinal spacing between said stop elements of the first set.

4,223,565

DEVICE FOR ATTENUATING VIBRATIONS IN A DRIVE SHAFT OF A MOTOR VEHICLE

Tomoyuki Sugiyama, Niiza; Shigeru Machida, Kawagoe; Akihiro Kubo, Kuki; Junichi Araki, Asaka, and Nobuyuki Nakamura, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1977, Ser. No. 859,032

Claims priority, application Japan, Dec. 11, 1976, 51-166343[U]; Aug. 15, 1977, 52-108931[U]

Int. Cl.[2] F16F *5/10*

U.S. Cl. 74—574 **13 Claims**

1. A vibration absorbing and attenuating device for drive shafts in a motor vehicle, wherein driving force from an engine is transmitted to both left and right drive shafts through a clutch, a power transmission mechanism, and differential gears, which comprises in combination:

(a) a circular disc made of a resilient material having a boss at the center part thereof to be fitted and secured around the outer peripheral surface of said drive shaft;

(b) said circular disc including a plurality of radially expandable and contactible cushioning members, integral with said boss, extending radially from said boss;

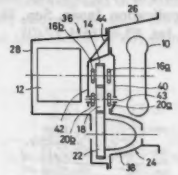
(c) a ring-shaped weight surrounding said circular disc and connecting the tip ends of said plurality of cushioning members, said weight being embedded in an annular groove formed in the outer peripheral surface of said resilient circular disc as an integral whole therewith; and

(d) a plurality of stoppers projectively positioned between said adjacent cushioning members to restrict expansion and contraction of said cushioning members.

4,223,566
TRANSVERSE AUTOMATIC POWER TRANSMISSION WITH IMPROVED BEARING CONSTRUCTION FOR OUTPUT GEAR ELEMENTS

Takahiro Yamamori, Tokyo; Kazuyoshi Iwanaga, and Kunio Ohtsuka, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 29, 1978, Ser. No. 947,220
Claims priority, application Japan, Sep. 18, 1978, 53-114941
Int. Cl.[2] F16H *57/02, 37/08*
U.S. Cl. 74—606 R 16 Claims



1. A power transmission including a torque converter housed in a converter housing, a planetary gear system that includes planetary gear elements, a power input shaft of said planetary gear system being connected to a driven member of said torque converter, a power output shaft of said planetary gear system having an output gear disposed between said torque converter and said gear elements, first and second bearing members arranged on either side of said output gear to rotatably support the same, an idler gear meshing with said output gear for providing drive connection between said output gear and a final drive unit, third and fourth bearing members for rotatably supporting said idler gear, and a gear unit housing enclosing said planetary gear system, said power transmission comprising:

a first support member integral in a one piece unitary manner with and defined in a portion of said converter housing, said first support member being located between said gear elements and said output gear and having an opening in which said first bearing member is disposed for rotatably supporting in part said output gear relative to said first support member and a second opening through which said idler gear projects to mesh with said output gear;

a second support member detachably disposed within and connected to the interior of said converter housing and having a bore in which said second bearing member is disposed for rotatably supporting in part said output gear relative to said second support member; and

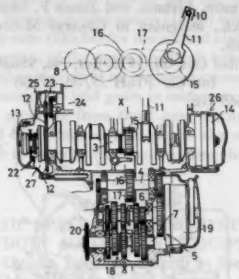
a third support member consisting of a shaft extending between and detachably fixed to said first and second support members, said third support member mounting thereon said third and fourth bearing members on which said idler gear is rotatably supported.

4,223,567
POWER TRANSMISSION APPARATUS

Takanori Onda, Kawagoe, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 29, 1979, Ser. No. 25,063
Claims priority, application Japan, Apr. 3, 1978, 53-42455; Apr. 28, 1978, 53-57808
Int. Cl.[2] F16H *57/02*
U.S. Cl. 74—606 R 2 Claims

1. A power transmission apparatus of the type that a crankshaft of an internal combustion engine, an intermediate driving shaft to be driven by the crankshaft, input and output shafts of a gear transmission driven by the driving shaft are so provided in an outer surrounding machine casing as to be arranged in a row and parallel to one another wherein: the four shafts are positioned at their axes of rotation in a common plane, and the

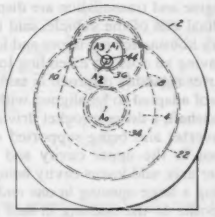


machine casing is so constructed as to be divisible at tht plane into upper and lower half portions.

4,223,568
PRECISION POLYGON GENERATOR

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed Nov. 8, 1978, Ser. No. 958,934
Int. Cl.[2] F16H *37/06, 1/28*
U.S. Cl. 74—660 7 Claims



1. A mechanism capable of generating with high precision a regular polygonal path having N sides comprising:

(a) a frame,

(b) a first rotating member mounted for rotation on said frame and rotating in a first angular direction at a first angular velocity about a fixed first axis,

(c) a second rotating member mounted for rotation on said first rotating member and rotating on a moving second axis displaced from said first axis,

(d) first means connecting for rotation said second rotating member and said frame through which said second rotating member rotates with respect to said first rotating member in a second direction opposite to said first direction and at a second angular velocity equal to N times said first angular velocity,

(e) a third rotating member mounted for rotation on said second rotating member and rotating about a moving third axis displaced from said second axis,

(f) second means connecting for rotation said first rotating member and said third rotating member through which said third rotating member rotates with respect to said second rotating member in a direction opposite said second direction and at a third angular velocity two times as great as said second angular velocity,

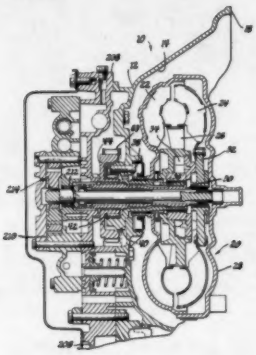
(g) an eccentric output member mounted on said third rotating member centered on a fourth axis displaced from said third axis, and

(h) means driving one of said rotating members.

4,223,569
TRANSVERSE TRANSMISSION WITH PARALLEL, COPLANAR AXIS

Erkki A. Koivunen, Livonia, and James F. Sherman, Brighton, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 30, 1978, Ser. No. 956,062
Int. Cl.[2] F16H *37/06, 37/08*
U.S. Cl. 74—665 GE **2 Claims**

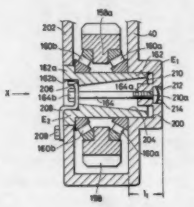


1. A multi-speed planetary step ratio transmission adapted to be used with an internal combustion engine for a motor vehicle wherein the engine and transmission are disposed transversely to the longitudinal axis of the vehicle, said transmission comprising; a unitary housing having upper and lower cavities, said upper cavity having an opening extending toward said engine; a torque converter rotatably disposed in said upper cavity, the centerline thereof adapted to be aligned with the centerline of the engine crankshaft, a drive sprocket drivingly connected to the torque converter and being supported on a bearing in a location external to the upper cavity and coaxial with the torque converter axis; said lower cavity being generally cylindrical and having a large opening in one end thereof facing in a direction opposite to the opening in said upper cavity and having a small diameter opening at the other end thereof; a multi-speed planetary gear means disposed in said lower cavity including axially spaced input and output sleeve shafts, a pair of simple interconnected planetary gear units, and a plurality of selectively engageable clutch means and brake means for selectively establishing a plurality of step ratios in the planetary gear units between the input and output sleeve shafts; a fixed ratio planetary reduction means having a ring gear secured for nonrotation in said lower cavity, a sun gear driven by said output sleeve shaft of said multi-speed planetary gear means, and a planetary carrier member; a bevel gear differential disposed in said lower cavity adjacent to and intermediate said planetary reduction means and said other end of said lower cavity, and having a differential carrier member drivingly connected to the planetary carrier member of said planetary reduction means, a pair of pinion gears mounted on said differential carrier and a pair of side gears meshing with said pinion gears; a first transmission output shaft drivingly connected to one of said side gears and extending through and rotatably supported in said small diameter opening in said lower cavity; a second transmission output shaft drivingly connected to said other side gear and extending coaxially with and through said planetary reduction unit, said output and input sleeve shafts of said multi-speed planetary gear means and extending outwardly from the large opening of said lower cavity; an end cap secured in said large opening of said lower cavity being disposed to rotatably support the input sleeve shaft of said multi-speed planetary gear means; a driven sprocket drivingly connected to said input sleeve shaft of said multi-speed planetary gear means and being rotatably supported in said wall portion; a chain member drivingly connecting said drive sprocket and said driven sprocket; and an end cap member enclosing said drive and driven sprockets and having a seal member disposed therein for sealing the outer diameter of said second output shaft.

4,223,570
POWER TRANSMISSION FOR AUTOMOTIVE VEHICLE

Takahiro Yamamori, Tokyo; Kazuyoshi Iwanaga, and Kunio Ohtsuka, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Nov. 8, 1978, Ser. No. 958,860
Claims priority, application Japan, Sep. 18, 1977, 53-114942
Int. Cl.[2] F16H *37/08*
U.S. Cl. 74—695 **21 Claims**



1. In a power transmission having a gear mechanism with an output shaft carrying an output gear, said output gear being connected to the input gear of a final drive unit by means of an idler gear rotatably supported between spaced opposed first and second walls of the transmission, the improvement comprising:

a cylindrical recess on the interior surface of said first wall and an opening in said second wall disposed oppositely to said cylindrical recess;

an integral projection on said first wall extending axially inwardly from the bottom of said recess towards said opening, said projection cooperating with said recess to define an annular space;

a sleeve shaft supported by and extending between said first and second walls, said sleeve shaft having first and second end portions, said first end portion being received in said annular space and surrounding said projection, said second end portion being received in said opening;

bearing means on said sleeve shaft for rotatably supporting said idler gear;

and retainer means engageable with said projection for axially urging said sleeve shaft towards said first wall to thereby maintain said first end portion within said annular space.

4,223,571
TRANSMISSION WITH EPICYCLOIDAL TRAIN

Philippe Quémerais, Villepreux, and Jean Véron, Suresnes, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 3, 1978, Ser. No. 866,378
Claims priority, application France, Jan. 11, 1977, 77 00562
Int. Cl.[2] F16H *3/74*
U.S. Cl. 74—759 **8 Claims**

1. A transmission with epicyclic trains which comprises:

a housing;

a first (PS1), second (PS3) and third (PS4) planet wheel cage disposed within said housing;

a first (S1) and second (S2) planet wheel connected with said first (PS1) planet wheel cage;

a third (S3) and fourth (S4) planet wheel connected to said second (PS3) and third (PS4) planet wheel cage, respectively;

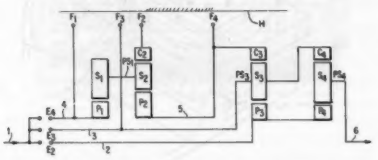
a first (P1) and second (P2) sun wheel connected to said first (S1) and second (S2) planet wheel, respectively;

a third (P3) and fourth (P4) interconnected sun wheel engaging said second (PS3) and third (PS4) planet wheel cage, respectively;

a first (C3) and second (C4) annulus drivingly connected to said second (PS3) and third (PS4) planet wheel cage, respectively, said second (C4) annulus interconnecting said second (PS3) and third (PS4) planet wheel cage;

a first (E2) and second (E3) clutch;

a first (2), second (3), third (4), and fourth (5) shaft, said first shaft (2) interconnecting said first clutch (E2) to said third (P3) sun wheel, said second shaft (3) interconnecting said first (PS1) and said second (PS3) planet wheel cage, said



third (4) shaft interconnecting said second (E3) clutch and said first sun wheel (P1), and said fourth (5) shaft interconnecting said second (P2) sun wheel and said first (C3) annulus;

an input shaft (1) connected to said first (E2) and said second (E4) clutch and an output shaft (6) connected to said third (PS4) planet wheel cage; and

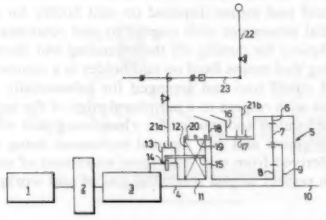
a first (F3) brake interconnecting said housing and said first (PS1) planet wheel cage for locking said first (PS1) planet wheel cage and a second brake (F4) interconnecting said housing and said fourth shaft (5) for locking said second (P2) sun wheel wherein all shafts under loads are accomplished by transfer of a single coupling action to another single coupling action.

4,223,572

OVERDRIVE FOR MOTOR VEHICLES

Stig H. A. Weiertz, Kungälv, and Grzegorz K. Janiszewski, Göteborg, both of Sweden, assignors to AB Volvo, Göteborg, Sweden

Filed Sep. 27, 1977, Ser. No. 837,212
Claims priority, application Sweden, Oct. 6, 1976, 7611073
Int. Cl.³ F16H *57/10;* F16D *67/02*
U.S. Cl. 74—781 R **5 Claims**



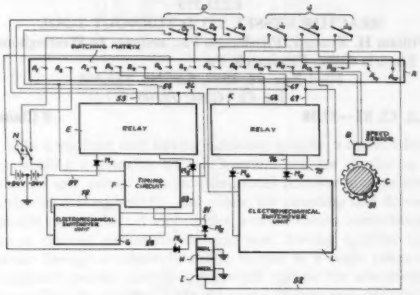
1. In an overdrive for motor vehicles, comprising a housing, a planetary carrier which is joined to an input shaft, a ring gear with internal teeth, which ring gear engages planet pinions carried on the planet carrier and is joined to an output shaft, a sun pinion engaging the planet pinions, and a main gear box coupled to the overdrive, said main gear box providing four forward gears and neutral, in addition to said overdrive; the improvement comprising a one-way clutch (12,42) that is coupled in-between the housing (11,33) of the overdrive and the sun pinion (8, 40), said one-way clutch being arranged to lock the sun pinion to the housing when driving torque is transmitted from the input shaft to the output shaft, a second clutch (16,18; 55,56) which establishes, when engaged, a non-turnable connection between the sun pinion and the ring gear, the one-way clutch having control means (13,50) which cooperate with operating means (21*b*,64) for the second clutch to suspend the blocking function of the one-way clutch before the second clutch is engaged, said control means being connected to a shift rod which is common to said gears in said main gear box, said shift rod being movable from third gear through neutral to fourth gear and being movable farther in the same direction from fourth gear to overdrive without passing through neutral.

4,223,573

AUTOMATIC SPEED-CHANGING SYSTEM FOR HEAVYDUTY AUTOMOTIVE EQUIPMENT

Jean Franssen, Ougrée, Belgium, assignor to Societe Anonyme C.E.T.I.M., Chênée, Belgium

Continuation-in-part of Ser. No. 694,968, Jun. 11, 1976, abandoned. This application Aug. 24, 1978, Ser. No. 936,597
Claims priority, application Belgium, Jun. 12, 1975, 45045
Int. Cl.² B60K *41/04*
U.S. Cl. 74—858 **6 Claims**



1. An automatic speed-changing system for automotive equipment provided with an internal-combustion engine, a reversible transmission driven by said engine, said transmission having an output shaft adapted to be coupled to said engine by a shiftable gear train provided with first gear-shifting means for selectively establishing a forward mode, a neutral mode and a reverse mode and with second gear-shifting means for establishing any one of a plurality of different speed ratios between said engine and said output shaft, and driver-actuated means for changing the operating speed of said engine,

the combination therewith of:

manually operable selector means connected to said first gear-shifting means for establishing any one of said modes;

speed-sensing means coacting with said output shaft and connected to said second gear-shifting means for establishing different speed ratios in response to shaft speeds passing predetermined levels; and

automatic decelerating means coupled with said engine and responsive to said speed-sensing means for temporarily slowing down said engine independently of said driver-actuated means during upshifting from a lower speed ratio to a higher speed ratio.

4,223,574

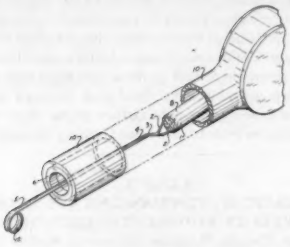
AXEL RETRACTER

Richard S. Wickett, 703 E. Second, Indianola, Iowa 50125

Filed Apr. 5, 1978, Ser. No. 893,670
Int. Cl.³ B25B *27/00*
U.S. Cl. 81—3 R **4 Claims**

1. A tool for use in the removal of a broken axle from the housing of a axle driven vehicle, such tool comprising spring

steel construction with prongs on one end, which serve as main springs, said prongs not to be farther apart at their widest point



then diameter of axle, and twisted inward, clockwise and counter-clockwise to angles of 45° to facillitate manipulation of tool under broken axle, and bent downward at a 30° angle.

4,223,575

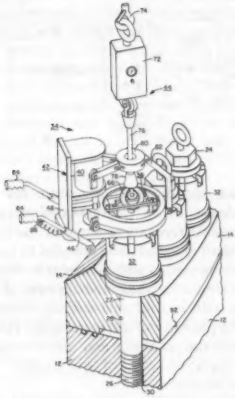
REACTOR VESSEL STUD TURNOUT TOOL

William H. Krueger, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 21, 1977, Ser. No. 853,368

Int. Cl.[3] **G21C** *13/06*

U.S. Cl. 81—57.38 **9 Claims**



1. Apparatus for manipulating reactor vessel studs comprising:

a carriage;

engagement means associated with said carriage for firmly contacting said studs;

rotation means mounted on said carriage and connected to said engagement means for rotating said engagement means when said engagement means is in contact with said studs thereby manipulating said stubs;

drive means mounted on said carriage and connected to said rotation means for rotating said rotation means;

a vertical mounting member;

a load equalizing device attached to said vertical mounting member for establishing a uniform vertical force; and

a swivel connecting rod attached at one end to said load equalizing device and removably attachable to said studs at the other end for transmitting a uniform vertical force from said load equalizing device to said studs for maintaining a uniform vertical force on said studs.

4,223,576

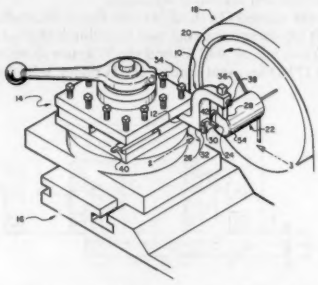
APPARATUS AND METHOD FOR LATHE CUTOFF AND CHAMFER

James E. Donnelly, Gastonia, N.C., assignor to Spin-O-Magic, Inc., Gastonia, N.C.

Filed Oct. 5, 1978, Ser. No. 948,825

Int. Cl.[3] **B23B** *1/00, 29/26*

U.S. Cl. 82—1 C **9 Claims**



5. A method of cutting off and chamfering a workpiece as it is turned in a lathe, said method comprising the steps of:

(a) securing a workpiece to the spindle of said lathe for rotation therewith;

(b) rotating said workpiece about an axis of rotation;

(c) securing a cutoff tool and a chamfering tool fixedly to a cross-slide of said lathe;

(d) moving said cutoff tool by means of said cross-slide substantially radially with respect to said axis of rotation of said workpiece and into cutting engagement with said workpiece to cut an annular groove therein;

(e) moving said chamfering tool substantially chordally with respect to the peripheral edges of said workpiece adjacent said groove simultaneously and commonly with said cutoff tool movement by means of said cross-slide and into chamfer cutting engagement thereby with at least one of said edges; and

(f) thereafter continuing said radially moving said cutoff tool for completion of said cutting off of said workpiece.

7. In combination with a lathe having a rotating spindle with a workpiece extending therefrom and having a cross slide arranged for movement transverse to the rotational axis of said rotating workpiece, the improvement comprising a tool holder mounted on the cross slide of the lathe for movement therewith, cutoff tool means disposed on said holder for substantially radial movement with respect to said rotational axis of said workpiece for cutting off the extending end thereof, and chamfering tool means fixed on said holder in a common plane with said cutoff tool and arranged for substantially chordal movement with respect to a peripheral edge of the workpiece cut by said cutoff tool means for chamfering said edge, said radial movement and said chordal movement being simultaneously derived from said transverse movement of said cross slide with respect to said rotational axis of said workpiece.

4,223,577

APPARATUS AND METHOD FOR MACHINING CYLINDRICAL INTERNAL SURFACES

Bernhard Seppelt, Solingen, Fed. Rep. of Germany, assignor to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,888

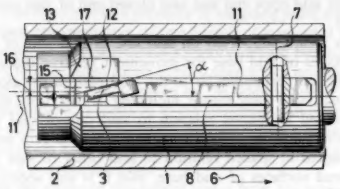
Claims priority, application Fed. Rep. of Germany, Oct. 13, 1977, 2746033

Int. Cl.[3] **B23B** *1/00, 41/06, 27/10*

U.S. Cl. 82—1 C **4 Claims**

4. A method of machining the interior surface of a cylindrical workpiece comprising the steps of: drawing a machining

head longitudinally through an elongated cylindrical workpiece, engaging the interior surface of the workpiece with a cutting tool carried by said head adjacent the trailing end thereof for generally radial inward and outward movement, relatively rotating said head and workpiece to machine said



surface and form metal chips, deflecting the chips into the free space in the workpiece beyond the trailing end of said head by mounting said cutting tool with a cutting edge extending both longitudinally and circumferentially of said head and with a chip deflecting surface facing both circumferentially of said head and longitudinally thereof back toward said trailing end.

4,223,578

APPARATUS AND METHOD FOR INTERNALLY PEELING PIPES

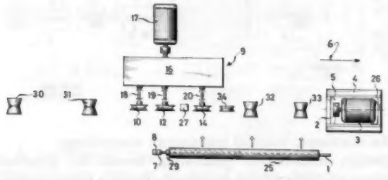
Alfons Goeke; Heinz Hartkopf; Eberhand Tückmantel, all of Solingen, and Wilhelm Schweer, Leichlingen, all of Fed. Rep. of Germany, assignors to Th. Kieserling & Albrecht, Solingen, Fed. Rep. of Germany

Filed Dec. 20, 1978, Ser. No. 971,375

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1978, 2800078

Int. Cl.[3] **B23B** *3/00, 35/00, 39/00*

U.S. Cl. 82—1 C **16 Claims**



13. A method of internally machining elongated pipe or the like comprising the steps of: positioning a machining head within a pipe, rotatably driving the machining head while longitudinally driving the pipe therepast in a direction from a leading pipe end toward a trailing pipe end, providing an external clamping force on the pipe generally radially inwardly of its longitudinal axis and in substantial alignment with the machining head, and maintaining said clamping force in substantial alignment with said machining head during said step of rotatably driving the machining head while longitudinally driving the pipe therepast.

4,223,579

MACHINE TOOL

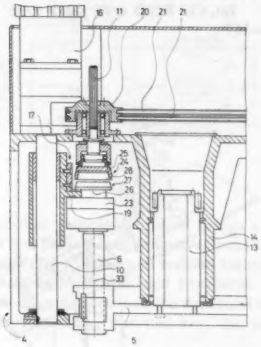
Gerhard Stark, Beethovenstr. 21, 7311 Notzingen, Fed. Rep. of Germany, and Günther Blum, Gullen/Ravensburg, Fed. Rep. of Germany, assignors to Gerhard Stark, Notzingen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,889

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1977, 2741802

Int. Cl.[3] **B23B** *3/34, 39/08, 39/20*

U.S. Cl. 82—3 **30 Claims**



1. In a machine tool having a driving spindle, a turret wheel for holding a plurality of tool carriers and for displacing a selected tool carrier into an operational position in alignment with said driving spindle, and means for coupling said driving spindle to the selected tool carrier, a combination comprising a direct current motor for driving said driving spindle, said motor having a relatively stable torque in a wide range of rotational speeds, and programmable means for electrically controlling the rotational speed and the angular rest position of the rotor of said motor and the feeding movement and speed of said tool carrier according to a predetermined program prepared for machining a particular workpiece.

4,223,580

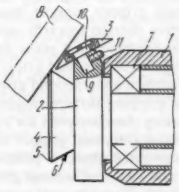
ROTARY CUTTING TOOL

Valery A. Sidorenko, Leninsky prospekt, 14, kv. 3; Evgeny I. Morgunsky, ulitsa Malaya, 15, kv. 1; Vladimir A. Plotnikov, ulitsa Gikalo, 28, kv. 17; Nikolai V. Vishnev, ulitsa Karastoyanovoi, 23, kv. 82, and Petr I. Yascheritsyn, Leninsky prospekt, 18, kv. 102, all of Minsk, U.S.S.R.

Filed Sep. 19, 1978, Ser. No. 943,650

Int. Cl.[3] **B23B** *25/02, 27/12*

U.S. Cl. 82—36 R **6 Claims**



1. A rotary cutting tool comprising, a body, a driven spindle in said body, a cutting element on a leading end of said spindle shaped as a solid of revolution, a chip breaker knife made as a solid of revolution, means on said spindle having an axis rotatably mounting said chip breaker knife for rotation about said

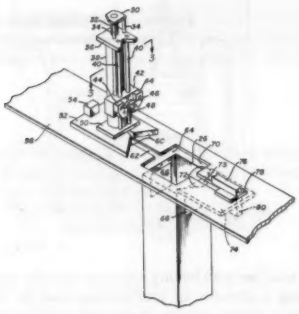
axis, said axis being disposed at an angle relative to a longitudinal axis of said spindle, and said chip breaker knife having a cutting edge disposed adjacent a cutting edge of said cutting element but spaced therefrom and from a workpiece being machined by said cutting element to allow chips to fall therebetween.

4,223,581

FEEDER APPARATUS FOR CABLE CUTTER

Jan Markiewicz, North Haven, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Mar. 22, 1978, Ser. No. 888,907
Int. Cl.[2] B26D *4/46*; G21F *9/36*
U.S. Cl. 83—167 **4 Claims**



1. An apparatus for effecting the forceful feeding of an elongated object and the subsequent cutting from the elongated object of a portion thereof comprising:

a. a base including a pair of spaced surfaces, said base having an opening provided therein, said opening extending between said pair of spaced surfaces;

b. a container cooperatively associated with said base for receiving therewithin a portion of the elongated object, said container having an open end and a closed end and a pair of openings formed therein adjacent said open end, said container being detachably supported with said open end thereof aligned with said opening in said base;

c. gripper support means supported on one of said pair of spaced surfaces of said base for movement relative thereto, said gripper support means being slidably movable into and out of alignment with said opening in said base and thereby into and out of alignment with said open end of said container;

d. a gripper block supported on said gripper support means for movement therewith, said gripper block further being supported on said gripper support means for reciprocal movement relative thereto towards and away from said open end of said container in a plane defined by the feed path of the elongated object, said gripper block including a first gripping surface and a second gripping surface, said first and second gripping surfaces together cooperatively defining an opening therebetween for receiving the elongated object therewithin, said gripper block being operative when the elongated object is positioned in the opening formed by said first and second gripping surfaces to effect the forceful feeding into said open end of said container through said opening in said base of at least a portion of the elongated object as said gripper block moves axially towards said open end of said container;

e. cutting means mounted on said gripper support means for movement therewith, said cutting means including cutting jaws supported in spaced relation to the other of said pair of spaced surfaces of said base, said cutting jaws being movable as said cutting means moves relative to said gripper support means between a first position wherein said cutting jaws project into the interior of said container through one of said pair of openings formed in said container and a second position wherein said cutting jaws are positioned outwardly of said container, said cutting jaws being operative when located in said first position thereof to effect the severing from the elongated object of the portion thereof located within said container at a point located along the length of the elongated object intermediate said open end and said closed end of said container; and

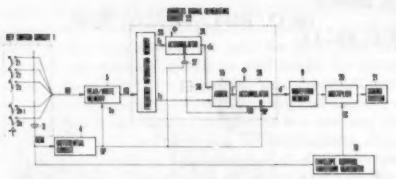
f. ram means supported on said one of said pair of spaced surfaces of said base for movement relative thereto in a direction perpendicular to the feed path of the elongated object, said ram means including a first ram movably mounted in spaced relation to said one of said pair of spaced surfaces of said base and a second ram movably mounted in spaced relation to said other of said pair of spaced surfaces of said base, said first and second rams each being movable between a first position wherein said first and second rams are each in engagement with the elongated object and a second position wherein said first and second rams are each disengaged from the elongated object, said first ram being operative when in said first position thereof to effect the insertion of the elongated object into the opening formed by said first and second gripping surfaces, said second ram when located in said first position thereof projecting into the interior of said container through the other of said pair of openings formed in said container and being operative when so positioned to effect the centering of the elongated object in said cutting jaws.

4,223,582

ELECTRONIC MUSICAL INSTRUMENT BY NONLINEARLY ADDRESSING WAVEFORM MEMORY

Mitsumi Kato, and Koji Niimi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Oct. 23, 1978, Ser. No. 953,440
Claims priority, application Japan, Oct. 26, 1977, 52-127634
Int. Cl.[3] G10H *1/00*
U.S. Cl. 84—1.01 **4 Claims**



1. An electronic musical instrument, comprising:

frequency information generating means for generating frequency information representative of a tone pitch associated with a depressed key;

frequency information varying means for producing a frequency information varying signal which changes with time during each period of said tone pitch;

means for combining said frequency information varying signal with said frequency information to produce a combined signal which changes during each period of said tone pitch and which is determined by the values of the frequency information varying signal and the frequency information;

accumulating means, having a modulus and responsive to the combined signal, for accumulating said combined

signal at a selected rate to provide an output signal of increasing value within the range of said modulus and for recycling when the output signal exceeds said modulus, the time between successive recyclings of the accumulating means defining a musical tone period,

said frequency information and said varying signal being of such values that the musical tone period defined by the time between successive accumulating means recyclings is equal to one period of the tone pitch associated with the depressed key;

a waveform memory device having a plurality of addresses at which are stored a plurality of sampling point amplitude values representative of one period of a selected musical waveform, the waveform memory device being responsive to an address signal applied thereto for producing the amplitude value designated by the address signal;

a sound system, responsive to the amplitude values produced by said waveform memory, for converting a musical tone waveform read out from said waveform memory device into a musical tone; and

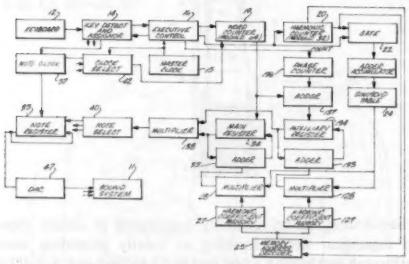
means for applying the output signal from the accumulator as the address signal to the waveform memory device, whereby a musical waveform different from the selected musical waveform stored in the waveform memory device is produced by the instrument as the combined signal accumulated by the accumulating means progresses at a rate which is varied cyclically within said period.

4,223,583

APPARATUS FOR PRODUCING MUSICAL TONES HAVING TIME VARIANT HARMONICS

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd., Hamamatsu, Japan

Filed Feb. 9, 1979, Ser. No. 11,058
Int. Cl.[2] G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **8 Claims**



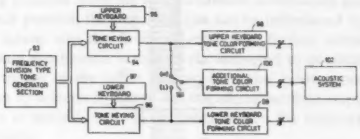
1. A polyphonic tone synthesizer comprising: means for storing a master data set of digital values defining a musical waveshape, digital-to-analog converter, means transferring each of said values in sequence, at a sequential rate proportional to the fundamental pitch of the tone, to said converter, and means for generating such digital values in the master data set including means generating and storing a first set of digitally coded values, means generating and storing a second set of values, means multiplying together and storing the products of pairs of values taken in sequence respectively from said first and second sets of values to form said master data set, and means for shifting the values in the second set relative to the values in the first set to change the pairing of the values from the two sets that are multiplied together.

4,223,584

ELECTRONIC MUSICAL INSTRUMENT

Akira Nakada; Eiichiro Aoki; Akiyoshi Oya; Takatoshi Okumura; Yasuji Uchiyama, and Eiichi Yamaga, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jan. 2, 1979, Ser. No. 81
Claims priority, application Japan, Jan. 10, 1978, 53-1734
Int. Cl.[3] G10H *3/06*
U.S. Cl. 84—1.17 **9 Claims**



1. In an electronic musical instrument having a plurality of keyboards and first musical tone generating means for generating musical tones corresponding to multibit binary coded key operation signals supplied from said keyboards, said signals specifying both the note name and the depressed and released state of the corresponding operated key, the improvement comprising:

a keyboard selecting switch, independent of the keys of said keyboard, for selecting one of said keyboards;

second musical tone generating means for generating musical tones corresponding to key operation signals; and

key code distribution and latching means for gating to said second musical tone generating means only the binary coded key operation signals of said single keyboard selected by said keyboard selecting switch, said second musical tone generating means thereby generating musical tones in response to the gated binary coded key operation signals independently of and in addition to generation by said first tone generating means of musical tones in response to key operation signals of the same selected single keyboard.

8. In an electronic musical instrument having plural keyboards, the improvement comprising:

a tone generator section including a plurality of individual tone generators each having a respective envelope waveform generator for establishing the waveform of the musical tone generated by the corresponding tone generator, each tone generator producing a musical tone corresponding to selected key information provided thereto, said key information including an indication of key depression and release, each waveform generator cooperating with the associated tone generator to continue tone production with gradual decay after the provided note information indicates that the associated key has been released,

keyboard selection switch means for selecting one of said plural keyboards and for providing to said tone generator section only the selected key information from that one selected keyboard, and

a common envelope control circuit, connected to all of said waveform generators and cooperating with said keyboard selection switch means, for providing to all of said waveform generators a waveform clearance signal each time that a different keyboard is selected by said keyboard selection switch means, said waveform generators, in response to receipt of said waveform clearance signal, causing rapid damping of all musical tones which at the time of receipt of said waveform clearance signal were being produced with gradual decay.

4,223,585

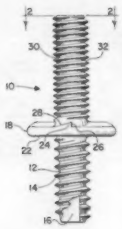
DOUBLE-ENDED STUD WITH COMBINED DRIVING AND LOCKING MEANS

Gerald D. Barth, and Walter T. Durham, both of Elgin, Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 805,056, Jun. 9, 1977, abandoned. This application Jul. 3, 1978, Ser. No. 921,662

Int. Cl.[2] **F16B** *23/00, 35/04*

U.S. Cl. 85—42 **7 Claims**



1. A fastener member including a first stud shank with a flange extending radially therefrom, said first stud shank including a helical thread formed thereon, said helical thread incorporating means to form a mating internal thread in a preformed bore in an associated work surface, the flange defining a lower surface adjacent said first stud and an upper surface opposite to said lower surface, upstanding protuberance means formed on said upper surface of the flange, said protuberance means including generally radially extending ribs each having a primary rotary driving surface extending upwardly perpendicularly from the upper surface of the flange, an upper surface on said protuberance formed as a first planar surface intersecting the primary rotary driving surface and extending generally perpendicular thereto, a secondary surface defined by a second planar surface which extends upwardly at an acute angle from the plane of the flange, the line of intersection between said first and second planar surfaces lying in a plane which extends generally tangentially from said first stud shank toward the primary driving surface, said line of intersection thus being disposed at an acute angle to the line of intersection between the first planar surface and the primary driving surface, said protuberance means being adapted for one-way engagement by a mating tool to rotate the fastener member about its axis into the bore in the associated workpiece.

4,223,586

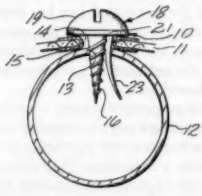
ANCHOR FOR SHEET METAL SCREWS AND THE LIKE

Michael J. Miller, 3532 W. Colter Ave., Phoenix, Ariz. 85019

Continuation-in-part of Ser. No. 737,330, Nov. 1, 1976, abandoned. This application Sep. 12, 1977, Ser. No. 832,561

Int. Cl.[2] **H01R** *7/08;* **F16B** *13/04*

U.S. Cl. 85—63 **15 Claims**



1. An assistance device for use with externally threaded fasteners in conjunction with blind holes oversize, as by stripping, relative to the fastener and occurring in a thin article such that the hole is substantially only two dimensional, the device comprising a substantially planar washer-like head having an opening substantially centrally therethrough for passage through the head of the shank of an externally threaded fastener such as a sheet metal screw, and a single laterally deflectable and deformable finger portion connected at one end thereof to the head effectively along a portion of the boundary of the opening and extending away from the head to the other end thereof which is spaced from the head, the other end of the finger being disposed relative to the axis of the opening sufficiently that the finger, upon insertion thereof into a hole in an article to which a connection is to be made and upon insertion of the shank of an externally threaded fastener into the hole through the opening in the head of the device, engages with and interferes with the fastener threads to provide a bite for the threads and is deflected away from the fastener shank and is inelastically permanently deformed by the fastener shank between the shank and the hole to jam and to deform in the hole and around the blind side of the hole sufficiently to secure the device from rotation in the hole and from movement out of the hole.

4,223,587

SELF-DRILLING DOWEL ASSEMBLY WITH AN ANNULAR DRILL BIT

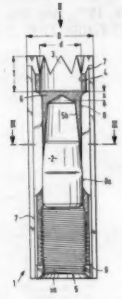
Paul Deutschenbaur, Unterpfaffenhofen, Fed. Rep. of Germany, assignor to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Feb. 14, 1979, Ser. No. 12,102

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1978, 2808446

Int. Cl.[2] **E04B** *1/49;* **F16B** *13/06*

U.S. Cl. 85—68 **18 Claims**



1. Self-drilling dowel assembly comprising an axially elongated expansion sleeve forming an axially extending bore therethrough and having a first end and a second end, a drill bit formed on the first end of said expansion sleeve, a partition wall located within the bore in said expansion sleeve and extending transversely across and dividing the bore into a first blind bore extending from the first end of said sleeve to said partition wall and a second blind bore extending from the second end of said sleeve to said partition wall, a spreader positioned within the second blind bore in said sleeve and said spreader being axially displaceable within the bore in the direction from the second end toward the first end in frictional contact with the surface of the second bore for expanding said sleeve outwardly, wherein the improvement comprises that the first blind bore in said expansion sleeve has a diameter in the range of 0.5 to 0.9 times the exterior diameter of said expansion sleeve at the first end thereof.

4,223,588

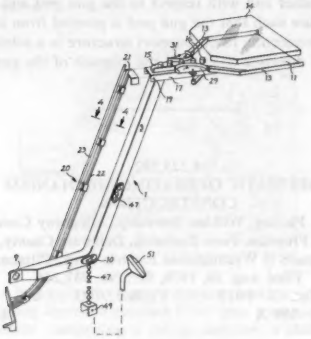
PRIMER FEED DEVICE

Frank H. Simpson, Rt. 2 Box 276, Cornelius, Oreg. 97113

Filed Apr. 20, 1979, Ser. No. 31,765

Int. Cl.³ F42B *33/00*

U.S. Cl. 86—45 **10 Claims**



1. A primer feeding device for a cartridge reloading machine comprising:

a frame;

primer holding means on the frame;

a pivotable primer feed roll operatively connected to the primer holding means;

and means for directing a primer from the primer holding means to the reloading machine.

4,223,589

DOUBLE-FEED SPROCKET ARRANGEMENT FOR MUNITION CHANGING IN AUTOMATIC GUNS

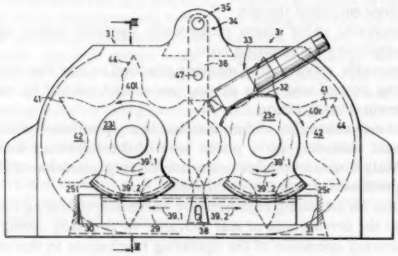
Lothar Post, Duesseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Dec. 26, 1978, Ser. No. 973,105

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757663

Int. Cl.³ F41D *10/16*

U.S. Cl. 89—33 SF **3 Claims**



1. An improved double-feed arrangement for introducing munition shells into the breech of an automatic weapon having a breech block, in particular a machine gun, wherein the double-feed arrangement comprises a housing in which are two feeders respectively operatively mounted equidistantly from the longitudinal axis of said weapon for feeding two different types of shells into the breech of the automatic weapon, each feeder having a hollow shaft rotatably mounted in said housing, a sprocket wheel having a plurality of equidistantly spaced ammunition receiving seats axially mounted on each support shaft, said sprocket wheels being rotatable in mutually opposite directions, a guide means slidably movably mounted in said housing between two end positions in directions transverse to the longitudinal axis of said weapon, a driving mechanism operatively connected to said guide means via a switching mechanism, whereby the guide means is positioned in one of the two end positions by the switching mechanism during a firing cycle to thereby guide a first shell from the receiving seat of the corresponding sprocket wheel of the corresponding feeder into a firing chamber introducing position at which position said first shell can be introduced by the breech block into the firing chamber of the automatic weapon and being adapted to further guide said first shell back into a middle waiting position from the firing chamber introducing position at which position the first shell can not be introduced by said guide means into the firing chamber and further when said switching mechanism is selectively activated to position said guide means in the other end position the guide means are adapted to selectively carry out the aforedescribed steps with respect to second shells of the other feeder, the improvement comprising:

(a) wherein said guide means include an exterior and an interior lever rigidly secured to each other in confronting relationship by means of a shaft which is rotatably mounted in said housing;

(b) said shaft extending parallel to the longitudinal axis of the automatic weapon;

(c) said guide means further including a bar slidably moveable between said two end positions and being operatively connected to said exterior lever;

(d) said first and second shells in said housing being disposed in the receiving seats of the sprocket wheels of the respective feeders with the exception of the shell mounted in the middle position between the two sprocket wheels;

(e) when said switching mechanism is selectively actuated to disable one feeder and activate the other feeder the first shell most proximate to the firing chamber introducing position is returned by said guide means to the receiving seat of the sprocket wheel from which it had been moved into the firing chamber introducing position; said switching mechanism including said pair of hollow transport shafts on which said sprocket wheels are rigidly coaxially mounted, said transport shafts being rotated by said driving mechanism in a stepwise manner and in the same rotational direction during the switching operation from one feeder to the other feeder.

(f) when said exterior and interior lever are in a middle position in which said bar is not in one of said two end positions said guide means permits freedom of reciprocal movement for the breech block.

4,223,590

AMMUNITION BELT

John S. Donovan, 16503 Santa Rosa, Detroit, Mich. 48221

Division of Ser. No. 874,114, Feb. 1, 1978, Pat. No. 4,210,060, which is a continuation-in-part of Ser. No. 829,716, Sep. 1, 1977, abandoned. This application Jun. 11, 1979, Ser. No. 47,462

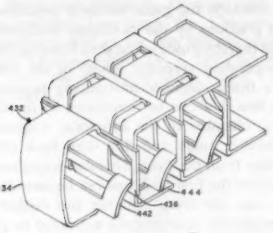
Int. Cl.³ F42B *39/08*

U.S. Cl. 89—35 R **2 Claims**

1. An assembly for an ammunition belt for an automatic weapon feed mechanism comprising:

a plurality of loop elements, each loop element including a portion looped to form an opening adapted to receive rounds of ammunition, and formed with a pair of leg sections extending from said opening from a points closely spaced to each other to diverge outwardly with forwardly bent shoulder portions of a greater width than said loop

sections and each having an opening formed therein to receive a succeeding loop section;



a cinch element extending about said leg sections at said closely spaced points maintaining said leg sections in position with respect to said loop section.

4,223,591

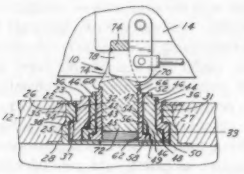
ADJUSTABLE MOUNT FOR GUN POD AND THE LIKE

Carl W. Croissant, Jr., Long Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Oct. 5, 1978, Ser. No. 948,926

Int. Cl.[3] **B64D** *7/00*

U.S. Cl. 89—37.5 L **7 Claims**



7. A gun adjusting mechanism for adjusting the azimuth and elevation of a gun pivotably connected to a support structure comprising:

means for fixedly mounting the gun to a gun pod substantially covering the gun;

means for pivotably mounting the gun pod to the support structure;

means connected to the gun pod and support structure spaced away from the pivoting means for adjusting the gun pod azimuth and elevation from one location on the exterior of the gun pod;

said adjusting means includes:

one of the gun pods or support structures having a first hole of circular cross section therein;

a first sleeve with a circular cross section rotatably mounted in the first hole;

the first sleeve having a second hole with a circular cross section therein;

the second hole having an axis offset from the axis of rotation of the first sleeve;

a second sleeve having a circular cross section rotatably mounted in the second hole;

the second sleeve having a third hole with a circular cross section therein;

the third hole having an axis offset from the axis of rotation of the second sleeve;

a third sleeve with a circular cross section rotatably mounted in the third hole;

the third sleeve having a central cylindrical and threaded aperture longitudinally extending therethrough;

a bolt means fixed to the other of the gun pod or support structure in a substantially vertical direction and threadably engaging the aperture means for the rotating the third sleeve with respect to the bolt means from adjusting the elevation of the gun with respect to the support structure; and

means for rotating the first and second sleeve with respect to each other and with respect to the gun pod and support structure such that the gun pod is pivoted from its pivotable connection to the support structure in a substantially lateral direction to control the azimuth of the gun.

4,223,592

PNEUMATIC OPERATING-MECHANISM CONSTRUCTION

William H. Fischer, Wilkins Township, Allegheny County, and Willie B. Freeman, Penn Township, Delaware County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 28, 1978, Ser. No. 937,246

Int. Cl.[3] **F01B** *1/02;* **F15B** *13/043, 13/06*

U.S. Cl. 91—189 A **4 Claims**

1. An improved pneumatic operating mechanism comprising, in combination:

means defining a stationary operating cylinder and a movable main driving piston reciprocally operable therewithin;

pneumatic valve means operable to admit a pneumatic operating fluid to a first driving side of said reciprocally-operable main driving piston;

said pneumatic valve means comprising a stationary valve-body housing-member having a stationary valve-piston bore provided therein;

a movable valve piston reciprocally operable within said stationary valve-piston bore;

a movable valve-sealing member attached to said first driving side of said main driving piston and carried by said main driving piston;

said movable valve sealing member being positioned within said stationary valve piston bore of the stationary valve body housing member in the non-driving condition of the pneumatic operating mechanism;

means for admitting high-pressure pneumatic operating fluid to the driving side of said movable valve piston during a driving operation of the operating mechanism to thereby force it into abutting sealing engagement with said movable valve sealing member during the first portion of the operation;

means defining an exhaust port means pneumatically communicating to the region interposed between the movable valve piston and said valve sealing member within the stationary valve piston bore;

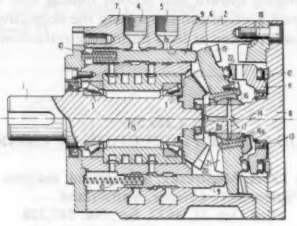
whereby during the final portion of the driving operation of the pneumatic operating mechanism the movable valve piston halts and blocks off the exhaust-port means whereas the main movable driving piston continues in its reciprocal driving motion within the operating cylinder to its final end driving position.

4,223,593

HYDRAULIC MOTOR

Hitoshi Kitayama, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 13, 1979, Ser. No. 11,830
Claims priority, application Japan, Feb. 14, 1978, 53/14925
Int. Cl.[3] F01B 3/10
U.S. Cl. 91—477 5 Claims



1. In a hydraulically operated rotary machine of the type incorporating therein a nutating bevel gear transmission train, said machine comprising a casing member, a shaft member journalled in said casing member, main bearing means interposed between said casing member and said shaft member such that one of said members is stationary while the other member is rotary or vice versa, a low pressure port and a high pressure port formed in said stationary member, a nutating member disposed for nutation in said casing member in coaxial relationship with said shaft member and including a first bevel gear and a second bevel gear, said first bevel gear being in mesh with a bevel gear mounted on said casing member, said second bevel gear being in mesh with a bevel gear carried by said shaft member and having a different number of teeth from that of the bevel gear carried by said shaft member, and a valve unit disposed within said casing member and including a plurality of pistons each of which is slidably disposed in said machine for reciprocal movement in the longitudinal direction of said casing member and functioning as a spool of a three-way valve, the pistons having free ends extending out of said valve unit and abutting against said nutating member, whereby the reciprocal movement of each of said pistons and the nutation of said nutating member operates such that a space behind the end of said piston remote from said free end thereof varies in volume, said hydraulic machine further comprising a swash plate having an inclined end face and being mounted by means of thrust and radial bearing means within said casing member for rotation in coaxial relationship with said shaft member, spherical surface bearing means with a spherical bearing surface mounted within said casing member in coaxial relationship with said shaft, between said pistons and said swash plate, said nutating member being carried by said spherical bearing means such that the center of the nutation of said nutating member coincides with the center of radius of the spherical bearing surface of said spherical bearing, and thrust bearing means interposed between said nutating member and said inclined end face of said swash plate, with said thrust bearing means being mounted on said nutating member.

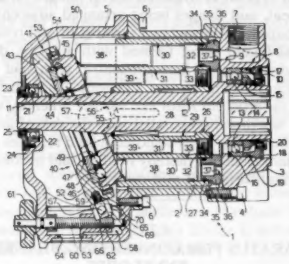
4,223,594

HYDRAULIC MOTOR

Lidio Gherner, Via Valdellatorre, 279, 10091 Alpignano, Torino, Italy

Filed Apr. 3, 1978, Ser. No. 892,489
Claims priority, application Italy, Apr. 5, 1977, 67743 A/77
Int. Cl.[3] F01B 13/04
U.S. Cl. 91—504 3 Claims

1. A hydraulic motor comprising a casing; a central shaft extending through said casing and supported by the latter to rotate about its own axis; a rotor housed in said casing and connected to said central shaft for rotation therewith; a plurality of cylindrical bores provided axially through said rotor; a cylindrical piston slidably and rotatably mounted in fluid tight relation to each of said bores; a toroidal member mounted within said casing to rotate about its own axis, and forming an angle with the axis of said central shaft; said toroidal member having a flat surface facing said rotor; a support member supporting said toroidal member in the casing and having hinge means cooperating with said casing and permitting the toroidal member to oscillate about an axis perpendicular to its axis of rotation and to the axis of the rotor; adjustment means being provided for varying said angle by tilting the support member



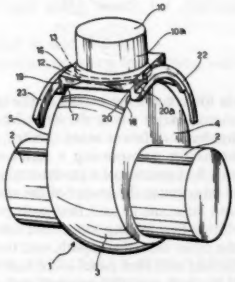
on said hinge means to change the orientation of said flat surface with respect to the axis of the central shaft; one end of each of said pistons cooperating with said flat surface of the toroidal member under the thrust of a predetermined hydraulic fluid in the bore, said one end of each of the pistons having an end face of substantially spherical shape, and said one end of each of said pistons also has a flat circular face traversing the axis of the piston and a significant portion of the end of the piston; said flat face being perpendicular to the axis of the piston and coaxial thereto.

4,223,595

DEVICE FOR COUPLING THE PISTONS TO THE ROTOR IN A RADIAL-PISTON HYDRAULIC MOTOR

Aurelio Ortelli, Bologna, Italy, assignor to Riva Calzoni S.p.A., Milan, Italy

Filed May 18, 1978, Ser. No. 906,920
Claims priority, application Italy, May 26, 1977, 24032 A/77
Int. Cl.[2] F04B 1/04
U.S. Cl. 92—72 3 Claims



1. In a radial-piston hydraulic motor of the type having a rotor eccentrically mounted to a drive shaft within a motor housing, wherein the rotor has a spherical circumferential surface and oppositely disposed flat annular end surfaces normal to the longitudinal axis of said shaft, the motor having a plurality of pistons radially disposed around the rotor, each piston being enclosed within a radial cavity formed with the motor housing, each cavity having a radially disposed inner

wall formed with a bearing seat, each piston having one end in permanent oscillating contact with said bearing seat and the other end in sliding contact with the spherical surface of said rotor, a device for coupling each of said pistons to said rotor, said device comprising:

an annular shoulder formed on said other end of said piston;

an auxiliary annular element formed with a circular aperture, said aperture being enclosed by a shoulder formed to mate with said shoulder on said piston, said auxiliary element being loosely concentrically mounted on said piston with said piston extending through said aperture;

a pair of oppositely disposed lateral flanges on said auxiliary element, said flanges being arranged adjacent and generally parallel with said end surfaces of said rotor, each said lateral flange being formed with a recess defined by a cylindrical arc surface concentric with said rotor and a surface adjacent to said cylindrical arc surface parallel with the adjacent rotor end surface whereby said recess is open in a direction parallel with the axis of said shaft; and

a pair of coupling rings disposed in said recesses of all of said auxiliary elements thereby holding said pistons against the spherical surface of said rotor.

4,223,596

APPARATUS FOR CONVERTING BLANKS INTO ENVELOPES

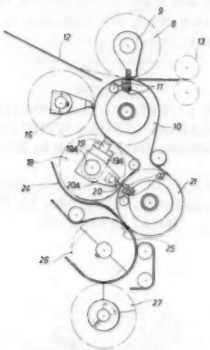
Karl-Heinz Honsel, Heidelberger Weg 15, D-4800 Bielefeld 1, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,295

Claims priority, application Fed. Rep. of Germany, Nov. 14, 1977, 2752411

Int. Cl.³ B31B *1/56*

U.S. Cl. 93—62 **9 Claims**



1. Apparatus for converting blanks of the type each having a first and a second major panel, the latter having at least two flaps extending from different sides thereof, into envelopes, comprising means for transporting a series of the blanks in succession into a first portion of a predetermined path wherein said first panel constitutes the leader of the respective blank; a first folding unit adjacent to said first path portion and comprising and orbiting first folding tool at one side and an orbiting first tongs at the other side of said path, said tool and said tongs cooperating to fold said first panel over said second panel of the respective blank in said first portion and to advance such folded blank with the fold at the leading end and with one of said flaps at the trailing end thereof into a second portion of said path; guide means adjacent to said second path portion and arranged to support said first panel prior to and during the folding thereof over said second panel; an orbiting suction head adjacent to a third portion of said path downstream of said second portion and arranged to engage the respective blank at the leading end zone thereof and to advance the same in said third path portion and said one fold toward a fourth portion of said path; a second folding unit adjacent to said fourth portion and including a second folding tool orbiting with said suction head at one side of said path and a second orbiting tongs at the other side of said path, said second tool and said second tongs cooperating to fold said first panel of the respective blank over said one flap during a retraction of the respective blank by said second folding tool from said third path portion with said one flap ahead; and additional guide means extending toward said second folding tool and along said third path portion and supporting the respective blank in said third path portion at least during the retraction thereof.

4,223,597

METHOD OF THE PRODUCTION OF CIGARETTE FILTERS

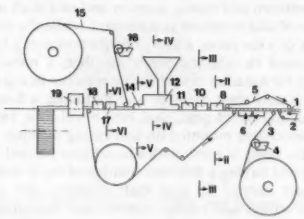
Jean-Pierre Lebet, Montreaux, Switzerland, assignor to Baumgartner Papiers S.A., Crissier, Switzerland

Filed Oct. 31, 1977, Ser. No. 847,328

Claims priority, application Switzerland, Nov. 26, 1976, 14908/76

Int. Cl.³ A24C *5/50*

U.S. Cl. 93—77 FT **11 Claims**



1. In a method of producing a cigarette filter with the aid of

a continuous and transparent covering strip of a constant width and having smooth surface portions,

a sealing strip of a width considerably smaller than the width of the covering strip, and

a filling device adapted to hold granular filter material, said granular filling material including activated charcoal provided with a coating of paint which does not affect its chemical effectiveness, the cigarette filter being provided with a chamber for holding said granular filter material, said filter material being visible through said chamber, the steps comprising:

spacing a plurality of filter elements successively apart at uniform separating distances, said covering strip having a width within a range of 75% to 93% of the circumference of said filter elements,

joining said filter elements to said continuous covering strip along a longitudinal portion thereof, so as to cover said filter elements continuously to form a filter cord having a plurality of said chambers, and so that lateral edges of said covering strip define a slit having a width slightly smaller than the width of said sealing strip, and extending over the entire length of said filter cord, as well as define a plurality of openings extending over said separating distances, respectively, in said filter cord,

sliding said filling device over said openings in intimate contact with the smooth surface portions of said covering strip,

filling the chambers with said granular filling material by said filling device,

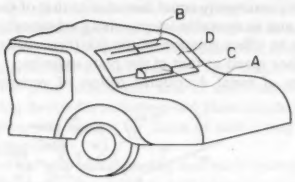
sealing the chambers upon completion of the filling step by said sealing strip, and

cutting said filter cord into a plurality of individual sections.

4,223,598
ELECTRONIC AIR CLEANER FOR PASSENGER COMPARTMENT OF VEHICLE

Kazuhiko Suzuki, Yokosuka, and Masazumi Sone, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Japan

Filed Apr. 10, 1979, Ser. No. 28,727
Claims priority, application Japan, May 30, 1978, 53-72353[U]
Int. Cl.³ B60H *3/06;* **B03C** *3/08, 3/38*
U.S. Cl. 98—2.11 **4 Claims**

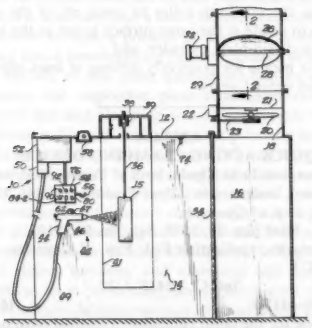


1. A vehicle having an electric device sensitive to an electric noise wave and an electronic air cleaner for cleaning air in a passenger compartment of said vehicle, said cleaner being positioned close to the sensitive electric device and comprising a first group of grounded plate electrodes which are spaced parallel to each other, each of said grounded plate electrodes extending toward the sensitive electric device such that each space defined between any adjacent two of said grounded plate electrodes faces the sensitive electric device, a second group of electrodes juxtaposed in said first group of grounded plate electrodes such that each of said second group of electrodes is spacedly disposed between the adjacent two of said first group of grounded plate electrodes, and an electric power source connected to both the first and second groups of electrodes for applying therebetween a high electric potential, wherein said first group of grounded plate electrodes have a flat electrically conductive section which is connected to and lies on the extending ends of said first group of grounded plate electrodes to substantially close the entrances of the spaces.

4,223,599
SPRAY BOOTH WITH ENERGY SAVING AND FIRE PROTECTION SYSTEMS

Stanley C. Napadow, Chicago, Ill., assignor to Protectaire Systems Corp., Elgin, Ill.

Filed Dec. 28, 1978, Ser. No. 973,947
Int. Cl.² B01D *45/00*
U.S. Cl. 98—115 SB **7 Claims**



1. An energy saving control system for use with a power operated device in a booth having an exhaust system with a blower means for withdrawing from the booth ambient air for flow through a damper to an exhausted location, said energy saving control system comprising:

motor means to the drive blower means to exhaust the ambient air through said damper and from said booth and causing an inflow of ambient air into said booth,

first control circuit means controlled with operation of said power operated means and having switch means operable with use and non-use of said power operated device in the booth;

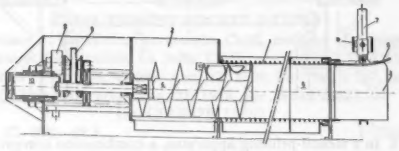
damper motor means for shifting said damper between an open position to allow exhausting of the ambient air from said booth and a closed position substantially blocking the flow of ambient air from said booth and through said exhaust system;

second circuit means controlled by operation of said switch means for operating said damper motor means to shift said damper to the closed position to block the flow of the ambient air from said booth when said switch means is in a position indicating said power operated device is off, and third circuit means continuing to operate said motor means for said blower means so that said blower means continues to operate but is ineffective to exhaust the ambient air while the power operated device is not in use and said damper is in the closed position.

4,223,600
CONTINUOUS PRESS AND METHOD FOR PRESSING FRUIT

Javier M. R. Adarraga, Logrono, Spain, assignor to Marrodan Y Rezola, S.A., Logrono, Spain

Filed Jan. 16, 1979, Ser. No. 3,928
Claims priority, application Spain, Jan. 16, 1978, 233.279[U]
Int. Cl.³ A47J *19/02;* **B30B** *9/02*
U.S. Cl. 100—37 **7 Claims**



1. A continuous press for fruit, especially for grapes comprising:

a compression chamber having inlet means for feeding material thereto and outlet means for discharging pressed material;

a screw arranged in said chamber;

means connected to said screw for rotating said screw in said chamber;

means connected to said screw for axially displacing said screw in said chamber between the inlet and outlet means;

means for controlling the axial displacement of the screw in said chamber; and

means associated with said outlet means for controlling the discharge pressure of the pressed material.

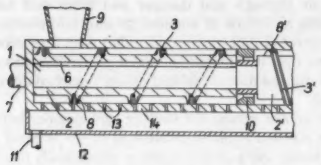
4,223,601
PRESS WORM, ESPECIALLY FOR FILTER PRESSES

Manfred Knuth, and Thorsten Homann, both of Hamburg, Fed. Rep. of Germany, assignors to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Oct. 4, 1978, Ser. No. 948,327
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1977, 2745391
Int. Cl.³ B30B *9/12*
U.S. Cl. 100—117 **6 Claims**

6. A filter press for the pressing of eatable-oil seeds comprising a cylinder, a worm rotatable in said cylinder and formed

with a body having a unitary helical flight, said flight having an outwardly open groove defined between walls unitary with the body extending continuously along the worm, and a weldment completely filling said groove flush with the outer periphery of said flight, said weldment being composed of a harder material than that of the worm.



4,223,602

STENCIL PRINTER

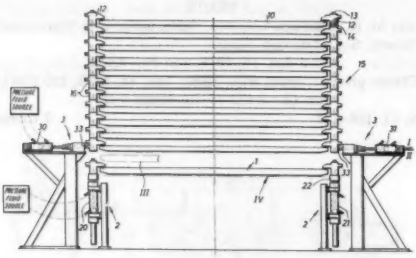
Mathias Mitter, Falkenstrasse 57, 4815 Schloss Holte, Fed. Rep. of Germany

Filed May 15, 1978, Ser. No. 905,870

Claims priority, application Fed. Rep. of Germany, May 16, 1977, 2722060

Int. Cl.³ B41F *15/36;* **B23Q** *7/06;* **B65D** *21/02*

U.S. Cl. 101—128.21 **7 Claims**



1. In a stencil-printing apparatus, a combination comprising a plurality of stencils each including a stencil frame and a stencil screen mounted in the same; interengageable means on said frames for enabling the stencils to be vertically superposed to form an upright stack which is upwardly spaced from a printing plane, said interengageable means including on opposite lateral sides of said frames respective transversely projecting lugs having projections and depressions, said lugs each including two parts and means connecting said two parts for movement relative to one another in the general plane of the respective frame; first means for lowering the respectively lowermost stencil of said stack to said printing plane so as to be available for printing onto a workpiece; and second means for holding the remaining stencils of the stack upwardly spaced from the printing plane and from the lowered stencil.

4,223,603

PLANETARY INKER FOR OFFSET PRINTING PRESS

Terry N. Faddis; Kenneth C. Clifton, and Robert A. Sweet, all of Emporia, Kans., assignors to Didde-Glaser, Inc., Emporia, Kans.

Continuation of Ser. No. 802,890, Jun. 2, 1977, abandoned. This application Jan. 10, 1979, Ser. No. 2,342

Int. Cl.³ B41F *7/04, 31/10*

U.S. Cl. 101—138 **6 Claims**

1. In an offset printing press having a blanket cylinder, a plate cylinder rotating in contact with the blanket cylinder, and ink fountain means, the combination therewith of a planetary inker for supplying ink to a plate on the plate cylinder from the ink fountain means without significant ghosting and comprising:

a single rubber coated ink form roller positioned to rotate in rolling contact with the plate on said plate cylinder,

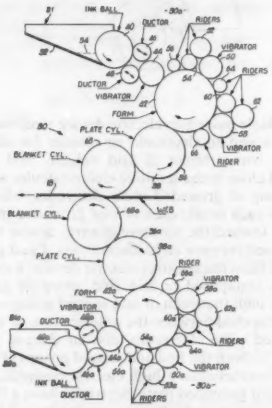
said ink form roller being of greater diameter than said plate cylinder,

a first gear coupled to said ink form roller at one end thereof in axial relationship thereto for effecting rotation of the ink form roller,

said first gear having an effective diameter approximately equal to that of the ink form roller;

a second gear secured to said plate cylinder axially thereof, of approximately equal diameter to that of the plate cylinder and in operable intermeshing relationship to the first gear to effect rotation of the ink form roller at the same surface speed as that of the plate cylinder;

a series of metal distributor rollers of varisized diameters



around and in rolling contact with the form roller, one of the distributor rollers being operably associated with

the ink fountain means for receiving ink therefrom and supplying such ink to the form roller at a controlled rate,

there being at least six distributor rollers of which at least two form a pair that are longitudinally oscillatable vibrator rollers in circumferentially spaced relationship about the periphery of the form roller and at least one non-oscillatable distributor roller between each adjacent pair of osciliatable vibrator rolls;

a planetary gear secured to an end of each of the vibrator rolls, of approximately the same diameter as a respective vibrator roller and located to intermesh with said first gear on the ink form roller to cause all of the vibrator rollers to rotate at the same surface speed as the ink form roller and said plate cylinder; and

gear drive means for positively driving at least one of said first and second gears.

4,223,604

QUICK-ACTING CLAMPING DEVICE

Bernd Brehm, and Fritz Kluzik, both of Frankenthal, Fed. Rep. of Germany, assignors to Albert-Frankenthal AG, Frankenthal, Fed. Rep. of Germany

Filed Sep. 28, 1978, Ser. No. 946,910

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1977, 2744371

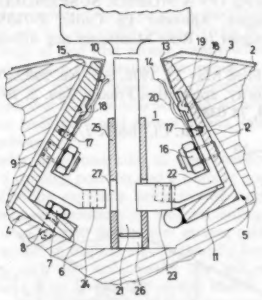
Int. Cl.² B41F *1/28*

U.S. Cl. 101—415.1 **16 Claims**

1. A device for the rapid clamping of flexible printing plates on the rotatable printing cylinder of rotating printing presses, which cylinder has at least one longitudinally-extending groove opening onto a circumferential surface thereof, which

groove has a base and a front and rear side, with respect to the direction of rotation thereof, of the type which includes at least one support bar positioned adjacent to the front side of said groove and bolted to the base of said groove, said support bar having a plate attachment arm to which a front end, with respect to the direction of rotation, of a printing plate can be clamped, at least one clamping arm lying in said groove opposite to said support bar and being pivotably mounted in said groove, said clamping arm having a bearing arm to which is secured a plate attachment arm which extends generally normally therefrom and to which a rear end, with respect to the direction of rotation, of a printing plate can be clamped, at least one pressure spring coupled to said clamping arm of biasely acting upon said clamping arm in a direction towards said front side of said groove which represents the clamping direction of said clamping arm, said spring extending approximately in the direction of the plate attachment arm of said clamping arm, and an adjusting device for actuating said plate attachment arm of said clamping arm against the force of said spring the improvement comprising:

said support bar and said clamping arm each having at least one clamping spring secured to said plate attachment arm thereof for gripping the front and rear end of said printing plate, respectively, said plate attachments arms each having a slider slidably mounted thereon and disposed for cooperative engagement with the associated spring of said plate attachment arm which slider is movable between a clamping position in which it moves at least a portion of said associated clamping spring into biased engagement with an opposing surface of said plate attachment arm to which it is secured and a non-clamping position, in which it moves at least a portion of said associated clamping string into a non-engaging position relative to said opposing surface of said plate attachment arm to which it is secured, the respective plate attachment arms of said support bar and clamping arm being separate by a space defining a channel, said sliders each having an actuating claw secured thereto which has a free end disposed in said channel on which is a toothing and wherein said device additionally includes a key having a beard which may be inserted into said channel and brought into separate contact with said toothing of each of said free ends of said claws whereupon turning of said key effects movement of said sliders between said clamping and non-clamping position, so as to, in turn, permit movement of said portions of said clamping springs into and out of engagement with said opposing surface of said support bar and clamping arm, respectively, independently of each other and of any pivotal movement of said clamping arm.

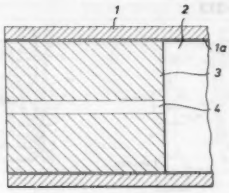


4,223,605

FUSE

Gustaf A. Larsson, Bokbindarvägen 1, S-632 22 Eskilstuna, Sweden

Filed Sep. 13, 1978, Ser. No. 941,972
Claims priority, application Sweden, Sep. 20, 1977, 7710491
Int. Cl.³ F42C *19/00*; C06C *5/04*
U.S. Cl. 102—27 R **2 Claims**



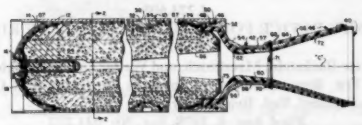
1. A fuse consisting of a wall structure defining a hollow elongated tube forming a gas channel, means for sustaining a detonation wave along said gas channel, said means comprising a reactive substance distributed as a thin layer on the inner surface of said tube and being exposed to said channel, characterised in that the fuse has a cylindrical block of a pyrotechnic charge inserted into at least one end of the gas channel.

4,223,606

DUAL THRUST ROCKET MOTOR

Lawrence J. Bornstein, Sacramento, Calif., assignor to Aerojet-General Corporation, La Jolla, Calif.

Division of Ser. No. 49,390, Aug. 12, 1960, Pat. No. 4,137,286. This application Aug. 21, 1978, Ser. No. 935,657
Int. Cl.² F42B *15/10*
U.S. Cl. 102—49.3 **1 Claim**



1. A solid propellant rocket motor comprising: an elongated hollow housing having a longitudinal axis, an annulus shaped ring fixedly attached to the interior of said housing, said ring used to support stabilizing fins, a nozzle fixedly attached to said housing, an elongate sustainer propellant grain received by said housing and attached in abutting relation with the housing and ring concentric with the housing longitudinal axis, a booster propellant grain received by the said sustainer propellant grain arranged concentrically with the said housing longitudinal axis, and sustainer propellant grain having a plurality of ribs extending inwardly and in abutting relation with the said booster propellant grain, said booster propellant grain having a star shaped passageway positioned concentric with the housing longitudinal axis, an igniter fixedly attached to the housing and arranged within the booster propellant grain passageway, a layer of heat insulation applied to the internal wall of the housing, and a discontinuous film of parting compound between the heat insulation and the sustainer propellant grain forming a band at each end of the sustainer propellant grain.

4,223,607

OPTO-ELECTRONIC MEASURING APPARATUS, PARTICULARLY FOR A PROJECTILE DETONATOR

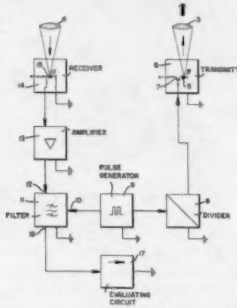
Uno Müller, Nuremberg, and Dietmar Stützle, Lauf, both of Fed. Rep. of Germany, assignors to Diehl, Nuremberg, Fed. Rep. of Germany

Filed Nov. 24, 1975, Ser. No. 635,679

Claims priority, application Fed. Rep. of Germany, Nov. 28, 1974, 2456162

Int. Cl.[3] F42C *13/02*

U.S. Cl. 102—213 7 Claims



1. In an opto-electronic measuring apparatus, in particular for a projectile detonator, for the delivery of a signal upon the reaching of a predetermined distance between a moving body and a surface; including a transmitter emitting signals at a transmitting frequency; a first lens rendering said impulses optical; a second lens for focusing a scattered-back portion of the optical impulses from the surface; and a receiver having a receiver-amplifier for receiving the scattered-back optical impulses, the improvement comprising: a band-pass filter having a narrow frequency pass range connected to the output of said receiver-amplifier; a regulating circuit connected intermediate said band-pass filter and said transmitter for correlating the median frequency of the frequency pass range of the band-pass filter and the transmitting frequency of the transmitter; and an evaluating circuit connected to the output of said band-pass filter for delivery of said signal.

4,223,608

SAFETY DEVICE FOR PERCUSSION-FUSE OF RIFLED MISSILES

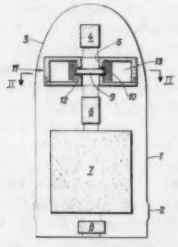
Guenter Backstein, Meerbusch, and Walter Unger, Krefeld, both of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 4, 1978, Ser. No. 931,272

Claims priority, application Fed. Rep. of Germany, Aug. 6, 1977, 2735575

Int. Cl.[3] F42C *15/34*

U.S. Cl. 102—244 3 Claims



1. A safety device for a primer tube of rifled missiles having a percussion fuse and an axially extending bore forming the primer tube, comprising in combination,

a blocking disc transversely slidably movably mounted in said missile relative to said primer tube in slotted wall means of said primer tube between a blocking position in which said primer tube is blocked by said blocking disc and an unblocked position in which said primer tube is at least partially unblocked by said blocking disc;

a pre-stressed tape-reel enveloping said blocking disc and being adapted to be at least partially unwound in an unwinding direction under the influence of a predetermined centrifugal force,

said missile having imparted to it a spin during its trajectory which is in a direction opposite to the unwinding direction of said tape-reel, said predetermined centrifugal force causing a slidable movement of said blocking disc determined by the unwinding direction of said tape-reel which is in a direction substantially opposite to the direction of twist of said missile, and which is at least vertically caused by the frictional contact between the blocking disc and said slotted wall means of said primer tube, to thereby effect a movement of said blocking disc from said blocking position to said unblocked position.

4,223,609

METHOD AND INSTALLATION FOR LOADING PASSENGERS ON A MOBILE SUSPENDED CARRIER

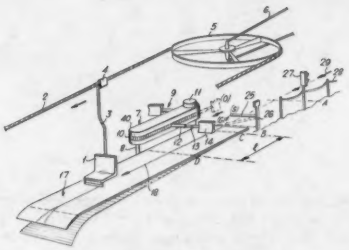
René Montagner, Allonzier La Caille, F-74350 Cruseilles, France, assignor to Rene Montagner nee Ailloud, Cruseilles, France

Filed May 23, 1978, Ser. No. 908,867

Claims priority, application France, Jun. 2, 1977, 77 16909; Feb. 10, 1978, 78 03886

Int. Cl.[2] B61K *1/00*

U.S. Cl. 104—20 27 Claims



1. Method for loading passengers onto carrying elements of a moving suspended carrying structure through driving or propelling the passengers in the direction of movement of the carrying elements in order to achieve increased passenger loading speed with a low relative velocity between passengers and the carrying elements, said method including the steps of engaging said passengers above their feet with a pushing instrument, pushing said passengers at a variable speed to accelerate the speed of the passengers, and thereafter engaging the passengers with the moving suspended carrying structure.

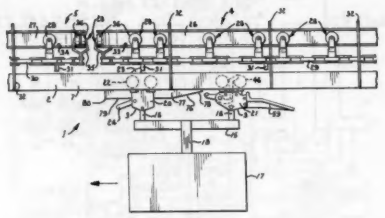
8. System for loading passengers onto carrying elements of a moving suspended carrying structure comprising a launching means for launching passengers capable of placing themselves in a plane approximately parallel to the plane of motion of the carrying structure and a controllable means for driving the launching means at variable speeds, said launching means including a pusher element means coupled to a driving device driven by a prime mover at a variable speed to engage the passengers above their feet and push the passengers in the direction of motion of the carrying-structure carrying elements on which they are to be loaded.

4,223,610

ACTUATED SECONDARY DOG FOR POWER AND FREE CONVEYOR SYSTEM

George D. Lempio, Overland Park, Kans., assignor to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Apr. 25, 1979, Ser. No. 33,269
Int. Cl.[3] B61B *12/02, 10/02, 13/00*
U.S. Cl. 104—172 S 11 Claims



1. In a power and free conveyor system including:
a load supporting track;
a train of interconnected trolleys riding on said track; one of said trolleys being a power trolley and one of said trolleys being a transfer trolley; at least one power means being a first power means and being positioned above said track and having power dogs depending therefrom; and
said power trolley normally being driven by one of said power dogs of said first power means when said power trolley is beneath said first power means;
the improvement being means for transferring said train through at least one transfer area wherein no power is applied to said power trolley by said power means, said transferring means comprising:
(a) a transfer dog connected to said transfer trolley and having a running position and a transfer position;
said transfer dog normally being in said running position, such that said transfer dog will not engage one of said power dogs of said first power means; said transfer dog being capable of displacement upwardly into said transfer position, such that said transfer dog will engage one of said power dogs of said first power means;
(b) an operating lever being pivotally connected at a medial point therealong to said transfer trolley and at one end thereof to said transfer dog;
(c) a cam follower being carried by the other end of said operating lever; and
(d) a cam having a cam surface positioned below said track; said cam follower engaging said cam surface whenever transfer of said train through one of said transfer areas is required, thereby operatively raising said transfer dog from said running position to said transfer position; whereby said transfer dog engages one of said first power means power dogs, thereby driving and transferring said train through said one transfer area.

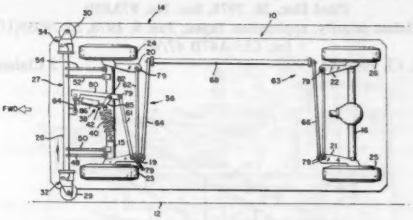
4,223,611

VEHICLE STEERING APPARATUS

John T. Dawson, and Duane A. Whitcomb, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Apr. 11, 1979, Ser. No. 28,959
Int. Cl.[3] B61F *9/00;* B61B *13/04;* B62D *1/26*
U.S. Cl. 104—247 13 Claims

1. Steering apparatus for a vehicle adapted to travel along a predetermined travel path bordered by at least one available guide surface providing directional guidance to the vehicle, the vehicle including at least one steerable wheel, the steering apparatus comprising: guide follower means including two rotatable guide wheels located adjacent opposite sides of the vehicle for respectively contacting available guide surfaces to cooperatively follow the contour thereof; and steering means operatively connected to said guide follower means for maintaining a selected one of said guide wheels in contact with the cooperative guide surface and turning the steerable wheel to control the direction of travel of the vehicle along the path in response to the position of the selected one guide wheel as it follows the contour of the cooperative guide surface; said steering means including bi-directional biasing means for applying opposite biasing forces to said guide wheels to maintain



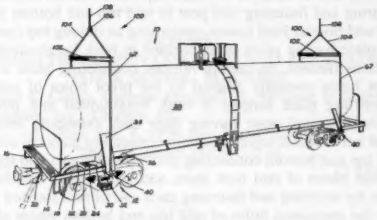
contact with the cooperative guide surfaces, said biasing means including a single source of biasing force providing a predetermined biasing force and biasing force control means operatively associated with said source for continously transmitting said biasing force to said guide wheels in alternate sequence, whereby said guide wheels may be biased without counteracting said source to control the biasing force applied.

4,223,612

LIFTING DEVICE FOR RAILWAY TANK CAR

Richard B. Polley, 20 Trappers Way, St. Charles, Mo. 63301

Filed Jan. 15, 1979, Ser. No. 3,180
Int. Cl.[3] B61D *49/00;* B61F *5/50;* B66C *1/20*
U.S. Cl. 105—1 R 6 Claims



6. A railway tank car comprising:
trucks located at opposite ends of the car, each truck supporting a tank car underframe, each tank car underframe supporting at least an end portion of a tank adapted for the transport of lading; each said underframe including a transverse tank support plate located generally above a respective one of said trucks and extending transversely of the car toward the side of the car; each of said tank supports including a lifting pocket near each outer end of said transverse support; said pocket including an opening for receiving a leg of a U-shaped lifting hook including a first leg having means for attachment to a chain or cable and an outer leg adapted to extend into said opening, said opening being in communication with a pocket formed above the opening receiving the lifting hook; said pocket including walls extending upwardly from said support, and a cover closing the top of the pocket; said pocket being spaced from the outer end of the support sufficient that the outer leg of the hook extends into the pocket transversely of the car, and the inner leg engages a vertical surface at the side of the car, whereby said side walls and cover plate prevent engagement of the hook in the pocket except with the with the hook extending transversely of the car with the

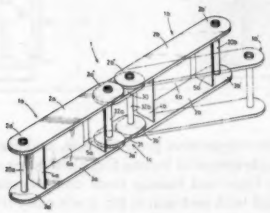
first leg engaging the side of the car and the outer leg extending into the pocket within 45° of the vertical axis of the tank.

4,223,613

SECTIONAL RACK

Keiichi Yoshizawa, Chiba, Japan, assignor to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Dec. 26, 1978, Ser. No. 973,050
Claims priority, application Japan, Jun. 9, 1978, 53-78059[U]
Int. Cl.[2] A47B 47/00
U.S. Cl. 108—64 **2 Claims**



1. A sectional rack comprising a plurality of modular rack units for holding articles and pivotal joint means for connecting said rack units together in such a manner that said rack units can pivotally swing relative to one another; said modular rack unit comprising an oblong top plate having connection holes formed in both longitudinal end portions thereof, an oblong bottom plate having connection holes coaxially aligned to the holes of said top plate in both longitudinal end portions thereof, a post for connecting said top and bottom plates together by fitting each end into one of the connection holes of said top and bottom plates, and a top and a bottom fastener for securing and fastening said post to said top and bottom plates; and said pivotal joint means comprising an oblong top connecting plate having pivot holes formed in both longitudinal end portions thereof, an oblong bottom connecting plate having pivot holes coaxially aligned to the pivot holes of said top connecting plate formed in both longitudinal end portions thereof, stepped posts having their ends extending into said pivot holes of said top and bottom connecting plates to connect said top and bottom connecting plates pivotally to said top and bottom plates of said rack units, and a top and a bottom fastener for securing and fastening each end of said stepped posts into the associated holes of said top and bottom plates of said rack units, said top fasteners of said modular rack units and of said pivotal joint means being formed with a recess and said bottom fasteners of said rack units and of said pivotal joint means each having a projection adapted to mate with said recess.

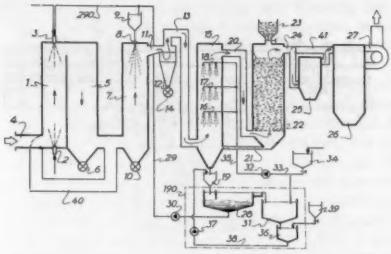
4,223,614

PLANT FOR THE TREATMENT OF WASTE

Per W. Barkhuus, Chesalles sur Oron, Switzerland, and Inge Faidt, Bjuv, Sweden, assignors to Gotaverken Oresundsvarvet AB, Landskrona, Sweden

Filed Jul. 16, 1979, Ser. No. 57,902
Claims priority, application Switzerland, Jul. 17, 1978, 7695/78
Int. Cl.[3] F23G 7/04; F23J 15/00
U.S. Cl. 110—238 **6 Claims**

1. A waste treatment plant characterized by the fact that it comprises a post-combustion chamber (1) equipped with an inlet (4) intended to be connected to the combustion chamber of a household rubbish incineration chamber and with at least one burner (2) adapted to treat the gaseous and pasty liquids contained in the sewage sludges and industrial liquids, in which post-combustion chamber (1) these wastes are injected into the burner and ignited by the hot gases coming from the combustion chamber to which it is connected and a treatment circuit for smoke and residues coming from said post-combustion chamber comprising, sequentially a dry cooling tower (7) into which sewage sludges without appreciable heating power are injected, a wet cooling and absorption tower (15) into which there is introduced a cooling solution adapted to absorb the



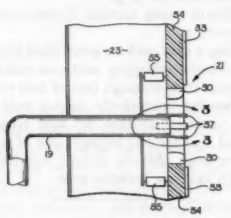
predominantly acid gases contained in the said smoke and residues and to which there is connected a recycling circuit (190) for said solution, a separation tower (22) in which the liquids in suspension are separated and directed for recycling to the recycling circuit (190), and a device (27) for placing the smoke and residue treatment circuit under vacuum.

4,223,615

LOW NOX COAL BURNER

Bernard P. Breen, and Arlen W. Bell, both of Laguna Beach, Calif., assignors to KVB, Inc., Irvine, Calif.

Continuation of Ser. No. 707,772, Jul. 22, 1976, abandoned. This application Aug. 7, 1978, Ser. No. 931,457
Int. Cl.[3] F23D 1/02
U.S. Cl. 110—264 **14 Claims**



1. In a burner for a pulverized coal furnace which includes a primary air and coal line ending in the throat of said burner, and a source of secondary air controllably fed into said burner, an improvement in said burner for reducing the formation of NO_x comprising:

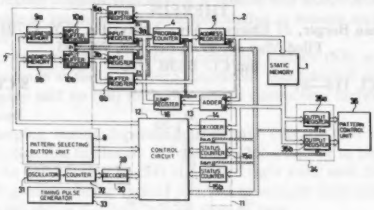
a plurality of finger-like spoilers coupled to and extending from the end of said primary air and coal line for disrupting the mixing of said coal and air so as to form coal-rich and air-rich radial zones and a coal-rich core, the number of said spoilers being selected so as to form said zones and core which tend to reduce the formation of NO_x, wherein said spoilers are circumferentially and uniformly spaced-apart about said burner end of said line and said number of said spoilers is no less than two and no more than six.

4,223,616

SYSTEM FOR GENERATING STITCH PATTERN SIGNALS FOR ELECTRONIC SEWING MACHINE

Hiroshi Kunimatsu, Osaka; Kinji Tabata, Nara; Kiyoshi Koreeda, Fujiidera, and Toshihiko Daido, Nara, all of Japan, assignors to Koyo Seiko Co. Limited and Koyo Machine Industries Co. Limited, both of Osaka, Japan

Filed Sep. 22, 1978, Ser. No. 944,986
Claims priority, application Japan, Dec. 12, 1977, 52/149614
Int. Cl.[2] D05B *3/02*
U.S. Cl. 112—158 E 8 Claims



1. In an electronic sewing machine in which the information relating to the stitching needle movement and to the feeding dog movement are stored in a static memory, is read out in timed relation to the rotation of the machine main shaft and is fed to drive means for controlling the amount and direction of the stitching and feeding movements to form stitch patterns, a system for generating stitch pattern signals comprising:

a static memory storing output data relating to the amount of bight or feed and storing order instructing data specifying the order in which the output data is to be read out, the output data and order instructing data being arranged in the static memory as bight relating data and feed relating data,

a pattern selecting unit for giving output address signals for accessing head data of a predetermined pattern forming program from the data stored in the static memory when operated by a machine operator,

a temporary memory for temporarily storing the output data read out from the static memory until the next output data is received and for transferring the stored output data to a pattern control unit for directly controlling the stitching needle movement and the feeding dog movement,

a control unit for receiving the output signal read out from the static memory and an address signal for specifying the address of the output signal, and the control unit including means for supplying to an address unit the address signal to be subsequently fed to the static memory, the control unit further including means for producing control signals for controlling the operation timing of the components of the system,

an address unit for temporarily storing the address signal to be used for the next address specification and which is received directly from the control unit or is prepared by the address unit in response to a control signal from the control unit, the address signal being stored until the next stitching movement or feeding movement is performed,

a reference signal generator for giving the control unit reference status signals for the control signals to be given by the control unit to the components, and

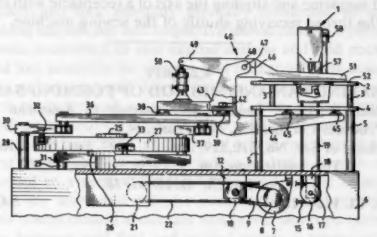
a timing pulse generator for feeding bight and feed timing signals to the control unit in timed relation to the rotation of the machine main shaft to cause the control unit to control the data to be produced from the address unit and the data to be produced from the temporary memory, alternately with respect to the bight and feed data.

4,223,617

LOOPTAKER ARRANGEMENT IN SEWING DEVICES

Egon Upmeier, Lage, and Günter Hagemeyer, Leopoldshöhe, both of Fed. Rep. of Germany, assignors to Kochs Adler AG, Bielefeld, Fed. Rep. of Germany

Filed Mar. 2, 1979, Ser. No. 16,922
Int. Cl.[2] D05B *57/30*
U.S. Cl. 112—184 5 Claims



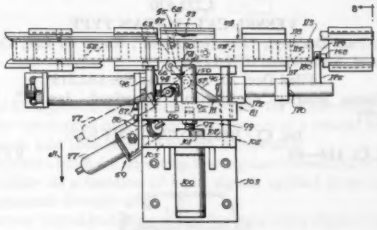
1. In a sewing device, comprising a stand, a workpiece supporting plate, workpiece clamping means, and a sewing machine received by said stand having stitch forming means including a looptaker rotatable about a specific axis relative to said clamping means and carrying a bobbin with a thread supply, control means for moving said workpiece clamping means relative to said stitch forming means, means for driving said control means and said looptaker, and means for moving said looptaker away from a sewing position in said axis to an easily accessible position in a different axis without disengaging its connection to said drive means whereby a clamped workpiece remains undisplaced relative to said workpiece supporting plate when said looptaker is replenished with thread supply.

4,223,618

AUTOMATIC BOBBIN CHANGER AND APPARATUS FOR A SEWING MACHINE

Raymond S. Cislak, Chicago Heights, Ill., assignor to Gateway Industries, Inc., Chicago, Ill.

Filed Feb. 9, 1978, Ser. No. 876,270
Int. Cl.[2] D05B *59/04, 57/26*
U.S. Cl. 112—186 12 Claims



1. An automatic bobbin changing apparatus for a sewing machine having a thread shuttle for receiving a bobbin assembly including a bobbin casing latched by a latch to a shaft of the thread shuttle and including a thread carrying bobbin in said bobbin casing, said apparatus comprising means for unlatching the bobbin casing from the shaft of said thread shuttle, means for extracting the used and unlatched bobbin assembly from the thread shuttle and for substituting therefor a new and unused bobbin assembly, a magazine means having receptacles therein for receiving a used bobbin from said extracting means and for holding unused bobbin assemblies for replacing a used bobbin assembly, control means for operating said unlatching

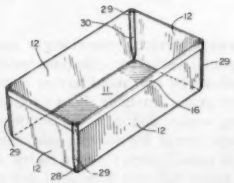
means and said means for extracting the used bobbin assembly and for substituting the new bobbin assembly therefor, an index means for stepping said magazine means after receiving a used bobbin assembly therein to present a used bobbin assembly in said magazine for transfer to the thread shuttle, said magazine comprising an elongated bar-shaped cartridge having a linear array of receptacles therein said indexing means indexing the cartridge to present a new bobbin assembly to a transfer station for transfer to said shuttle, and a registering means engaging said magazine and aligning the axis of a receptacle with the axis of the thread receiving shuttle of the sewing machine.

4,223,619

BAKING PAN AND METHOD OF FORMING SAME

Wilbert K. Hare, Lemont, Ill., assignor to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 810,119, Jun. 27, 1977, Pat. No. 4,167,233.
This application Apr. 9, 1979, Ser. No. 28,002
Int. Cl.³ B21D *51/18*
U.S. Cl. 113—120 G **5 Claims**



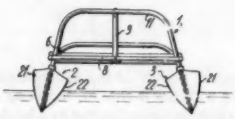
1. A method for forming a baking pan from a single blank of sheet metal of uniform thickness, comprising bending said blank along predetermined score lines to provide a bottom wall of rectangular plan and side walls extending upwardly from said bottom wall, said side walls having flanges formed at the terminal portions thereof, holding the adjacent flanges of adjacent side walls in abutting relationship, applying a localized high heat to the abutting adjacent flanges of the side walls thereby fusing said flanges to form a corner connection between adjacent side walls, applying pressure to the corner connection thereby reforming said corner connection to provide a corner post the outer surface of which lies within the point of intersection of the outer surfaces of said adjacent side walls.

4,223,620

VESSEL-CATAMARAN TYPE

Jean-Paul Dudouyt, "Les Gouttettes", Route du Lac, Coppet, Vaud, Switzerland (CH-1296)

Filed Dec. 20, 1977, Ser. No. 862,315
Claims priority, application Switzerland, Jan. 17, 1977, 508/77
Int. Cl.² B63B *35/00*; B63H *9/00*
U.S. Cl. 114—61 **9 Claims**



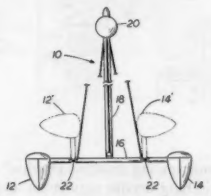
1. A vessel of the catamaran type comprising two substantially parallel hulls each forming a caisson having a base and top surface; a frame of U-shaped configuration for interconnecting the two hulls, said frame including a pair of substantially parallel spaced-apart limb portions and an arcuately shaped central portion with each of said limb portions extending fore and aft above a respective one of said caissons, transversely extending longitudinally spaced means for interconnecting said limb portions, two rigid members, each one of U-shaped configuration extending longitudinally fore and aft along the bottom of each respective hull; each of said rigid members including an upstanding extension at each of its ends, the extensions extending from the base to the top surface of the respective hull; said frame interconnecting the hulls by engagement of said extensions with a respective limb portion of said frame.

4,223,621

MULTIHULL SAILING VESSEL HAVING MEANS FOR RIGHTING CAPSIZED VESSELS INCORPORATED THEREIN

Herman Berger, 27 Emerson Ave., Amityville, N.Y. 11701

Filed May 19, 1978, Ser. No. 907,793
Int. Cl.³ B63B *1/00*
U.S. Cl. 114—61 **8 Claims**



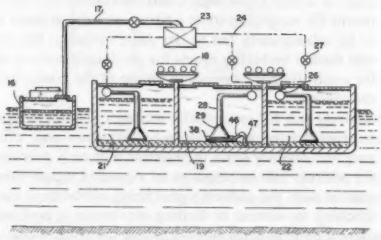
1. A Multi-hull sailing vessel comprising a plurality of floats extending along their longitudinal axes, transverse structure interconnecting said floats, and flotational means positioned above said floats, said interconnecting transverse structure spacing apart said floats along said longitudinal axes and having pivotal means for positioning each of said floats around the longitudinal axes of the other floats by moving the float in the water towards the mast while keeping the float out of the water fixed so as to effect a change in the center of gravity of said vessel in a direction for righting said vessel when said vessel capsizes.

4,223,622

TANKER DESLUDGING SYSTEM

Fabio Mazzucato, Bibione, and Roberto Tenti, Savona, both of Italy, assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 727,726, Sep. 29, 1976, abandoned. This application Oct. 25, 1977, Ser. No. 844,955
Int. Cl.² B63B *25/08*
U.S. Cl. 114—74 R **3 Claims**



1. In a marine vessel having at least one storage tank for holding and transporting liquid cargo, a closed manifold system communicated with said at least one storage tank for transferring said liquid cargo, said system including pumping means which is actuatable to establish a suction condition within the closed manifold system during a cargo offloading operation, and an intake pipe **(28)** forming an adjunct to said

manifold system and being fixedly positioned within said at least one storage tank, said intake pipe (28) having a bell housing including a lip (54), disposed at a position above the tank floor to ingest a flow of liquid cargo during said cargo offloading operation, the improvement therein of

portable tank cleaning means for removing sludge and other viscous residue from the floor of said tank subsequent to removal of liquid cargo therefrom, said tank cleaning means comprising;

an elongated flexible conduit (47) having a first end including an eductor (36) which is disconnectably engaged to, and in communication with said intake pipe (28,) said flexible conduit (47) having a remote end which is movable to reach into accumulated sludge at remote sections of the storage tank,

said eductor (36) including a clamping surface (53), which extends radially outward therefrom and adapted to engage said lip (54) to form a sealed connection therewith, and

clamping means depending from said eductor (36) being actuatable to elevate the eductor (36) whereby to engage the bell housing lip (54) in a sealed tight joint, said clamping means being further adapted to support said eductor (36) above the floor of said storage tank,

whereby a suction applied to said closed manifold when said pumping means is actuated, will cause said sludge to be ingested through said flexible conduit 47 and thence removed from the storage tank.

4,223,623

HINGED FLOATING CAISSONS AND UNFOLDING DEVICES THEREFOR

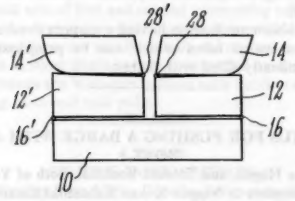
Roger Brunet, La Seyne-sur-Mer, and Gérard Marenco, Six-Fours-les-Plages, both of France, assignors to Constructions Navales et Industrielles de la Mediterranee, La Seyne-sur-Mer, France

Filed Apr. 17, 1978, Ser. No. 897,160

Claims priority, application France, Apr. 22, 1977, 77 12191

Int. Cl.[2] B63B *3/02*

U.S. Cl. 114—77 R **6 Claims**



1. A hinged floating box caisson structure comprising:

a central caisson;

a pair of lateral caissons hingedly connected to opposite ends of said central caisson by means of respective first pivots such that said lateral caissons are foldable about said first pivots with respect to said central caisson between an operative position, whereat said lateral caissons extend laterally of said opposite ends of said central caisson, and a transport position, whereat said lateral caissons are folded on top of said central caisson;

a pair of end ballasts hingedly connected to opposite free ends of said lateral caissons by means of respective second pivots such that said end ballasts are foldable about said second pivots with respect to respective said lateral caissons between an operative position, whereat said end ballasts extend substantially laterally of said respective lateral caissons when said lateral caissons are in said operative position thereof, and a transport position, whereat said end ballasts are folded on top of said respective lateral caissons when said lateral caissons are in said transport position thereof; and

each said end of said central caisson and the respective said lateral caisson and said end ballast having associated therewith means for moving said lateral caisson from said transport position thereof to said operative position thereof and for simultaneously moving said end ballast from said transport position thereat to said operative position thereof, each said moving means comprising a rocker and link assembly pivotally connected to said central caisson and said respective lateral caisson, cylinder means connected to said central caisson and said rocker and link assembly for moving said rocker and link assembly and causing said lateral caisson to rotate about said first pivot through an angle of 180° from said transport position thereof to said operative position thereof, and a constant length rope connected at a first end thereof to a first fixed point on said end ballast and at a second end thereof to a second fixed point on said central caisson, whereby when said cylinder means is operated to rotate said lateral caisson about said first pivot, said rope extending between said first and second points is tensioned to cause said end ballast to rotate about said second pivot from said transport position thereof to said operative position thereof.

4,223,624

AUTO-STEERING SYSTEM

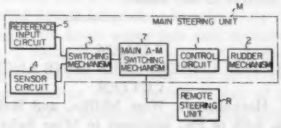
Motoi Iyeta, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Feb. 28, 1978, Ser. No. 882,122

Claims priority, application Japan, Mar. 2, 1977, 52-23868[U]; Mar. 2, 1977, 52-23869[U]; Mar. 16, 1977, 52-30909[U]; Mar. 16, 1977, 52-30910[U]; Mar. 31, 1977, 52-38710[U]

Int. Cl.[2] B63H *25/00, 25/36*

U.S. Cl. 114—144 E **14 Claims**



1. An improved auto-steering system for controlling the angular orientation of a rudder with respect to a neutral reference axis, said auto-steering system comprising:

a control circuit for adjusting the angular orientation of said rudder as a function of input signals applied to an input terminal thereof;

a sensor circuit including means for generating desired angular orientation input signals representative of a desired angular orientation of said rudder responsive to environmental factors influencing navigation;

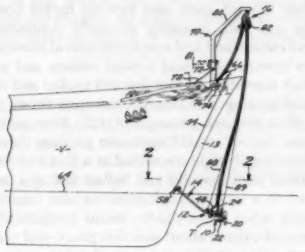
a reference input circuit which produces a predetermined reference input signal indicative of said neutral reference axis of said rudder; and

a switching mechanism for selectively applying either said desired angular orientation input signals or said reference input signal to said input terminal of said control circuit in such a manner that said rudder is placed in said neutral reference axis when said reference input signal is applied to said input terminal of said control circuit by said switching mechanism for zero-point calibration.

4,223,625
OUTBOARD THRUSTER FOR BOATS

Mario J. Puretic, 259 6th Ave. North, Monte Cristo Isle, Tierra Verde, Fla. 33715

Filed Jan. 16, 1978, Ser. No. 869,847
Int. Cl.[2] B63H *25/42*
U.S. Cl. 114—147 4 Claims



1. Outboard thruster apparatus for use on a marine vessel, said apparatus comprising:

a power-driven propulsion unit which when submerged provides thrust;

support means carrying said propulsion unit;

mounting means associated with the bow area of said vessel, said mounting means including a pair of generally vertically extending guide cables disposed on opposite sides of the bow area of said vessel, and a pair of legs affixed at their front ends to said support means and extending rearwardly from said support means to a slidable engagement with said guide cables;

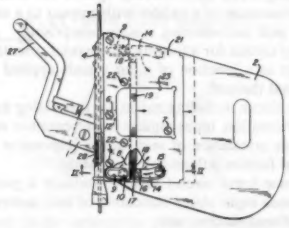
hoisting means on said vessel attached to said support means to raise and lower said support means and propulsion unit between a stowed position on said vessel and a submerged operative position; and

steering means operatively interposed between said propulsion unit and said support means to direct the thrust provided by said propulsion unit in different horizontal directions relative to said vessel.

4,223,626
SUPPORT FOR UNDERWATER MINE ANCHOR-LINE CUTTER

George E. Heckathorne, West Mifflin, and Robert A. Bub, Gibsonia, both of Pa., assignors to Mine Safety Appliances Company, Pittsburgh, Pa.

Filed Jan. 8, 1979, Ser. No. 1,873
Int. Cl.[3] B63B *9/00*
U.S. Cl. 114—221 A 11 Claims

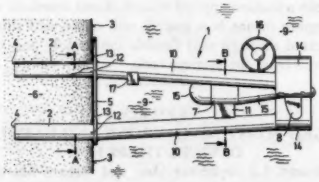


1. A support for an underwater mine anchor-line cutter, the support comprising an elevating fin having top and bottom surfaces and a leading front edge, a channel-shape sweep line retainer above the fin extending along said leading edge and joined to the fin, the open side of said retainer facing the trailing rear edge of the fin for admitting a sweep line to the retainer, a bar extending across the fin at the open side of the retainer, means mounting the bar on the fin for movement toward and away from said retainer, a pair of laterally spaced arms normally extending rearwardly away from said bar with their front ends engaging it to lock it in its forward position closing the open side of the retainer, means pivotally connecting the rear ends of the arms to the fin, spring means between the arms and connected thereto for normally holding them in bar-locking position, the central portion of said spring means being adapted to be pulled rearwardly to swing the front ends of the arms inwardly toward each other out of engagement with said bar, and means for then retracting the bar to open said retainer for admission or release of a sweep line.

4,223,627
PROPULSION DEVICE FOR EMBEDDING IN AN ICEBERG

Georges L. Mougin, Paris, France, assignor to ITI Limited, Paris, France

Filed Apr. 24, 1978, Ser. No. 899,251
Claims priority, application France, Apr. 22, 1977, 77 12178
Int. Cl.[2] B63B *21/56*
U.S. Cl. 114—242 9 Claims



1. A propulsion device for an iceberg comprising

a propulsion mechanism;

means for submerging the propulsion mechanism to a prescribed depth in the vicinity of the iceberg, and

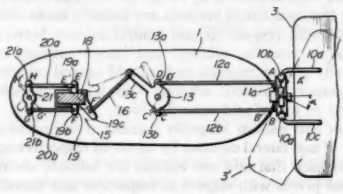
means for attaching the submerged propulsion mechanism to the iceberg at a prescribed position below the water line thereof,

said propulsion mechanism having a support structure which includes sealed tubes which can be progressively and independently filled with ballast.

4,223,628
APPARATUS FOR PUSHING A BARGE WITH A PUSH BOAT

Michinosuke Higuti, and Tatsuki Yoshikai, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 787,032, Apr. 18, 1977, abandoned.
This application Aug. 28, 1978, Ser. No. 937,535
Int. Cl.[3] B63B *21/00*
U.S. Cl. 114—246 1 Claim



1. Apparatus for pushing a barge with a push boat, comprising

(A) connecting mechanism disposed between said barge and said push boat and constructed in such a manner that

relative motion therebetween is free, said connecting mechanism comprising, in combination,

(a) a connecting body, a plurality of plates, and a plurality of sleeves, said connecting body comprising a first set of connecting units and a second set of connecting units held by said plates and slidable on said sleeves to define V-shapes between said first set of connecting units and between said second set of connecting units,

(b) a plurality of poles and a plurality of members, said poles being supported within said V-shapes and positioned at the front end of said push boat via said members,

(c) a first shaft, a projection, a base, and a plurality of extending members, said first shaft vertically running through substantially the center of said connecting mechanism and secured on said projection at the front end of said push boat via said base, said first shaft being formed with an upper step and a lower step between which said extending members of said first set of connecting units are arranged,

(B) a first linkage and set of first connecting rods, said first linkage turnably connected to said connecting mechanism via said first connecting rods to form a rectangle therewith which turns out a parallelogram by means of a drift angle caused by said barge,

(C) a second linkage and a second connecting rod, said second linkage turnably provided at the back of said push boat and connected to said first linkage via said second connecting rod,

(D) a steering mechanism and a second shaft, said steering mechanism provided on a heat of said second shaft supporting said second linkage, and

(E) a third linkage and a set of third connecting rods, said third linkage turnably provided on a head of a rudder shaft at the back end of said push boat and connected to said second linkage via said set of third connecting rods to form a rectangle therewith which turns out a parallelogram symmetrical to said parallelogram formed by said first linkage, by means of a drift angle transmitted through said rectangle,

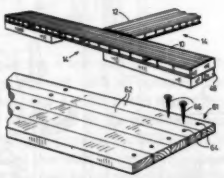
wherein with respect to the relative motion between said barge and said push boat through said connecting mechanism, a longitudinal displacement is provided by sliding action caused between said sets of first and second connecting units and said sleeves, and a transverse displacement is provided by sliding action caused between said first shaft and said extending members, and a vertical displacement is provided by sliding action caused between the V-shapes defined with the first and second connecting units and said poles.

4,223,629

MARINE DOCK SECTION

Dean A. Dunlop, Don Mills, Canada, assignor to Swing Stage Limited, Scarborough, Canada

Filed May 18, 1978, Ser. No. 907,214
Int. Cl.³ B63B *35/72*
U.S. Cl. 114—263 **5 Claims**



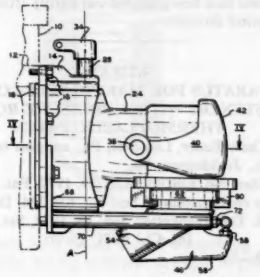
1. A dock section comprising, in combination: a pair of horizontally spaced apart elongated prefabricated frameworks, each framework comprising a pair of parallel, longitudinal, upper and lower tubular members rectangular in cross section secured a spaced distance apart by a plurality of equispaced vertical tubular struts circular in cross section which extend through and are double swaged into the longitudinal tubular members for rigid connection to the longitudinal tubular members, a plurality of cross members rigidly interconnecting said elongated prefabricated frameworks to form a planar, rectangular frame, said cross members each comprising an upper angle and a lower planar bar secured together by vertical struts whereby said upper angle provides a transverse support flange, a circular clamp extending from each of the upper angle and lower planar bar at each end of each cross member for encircling a vertical tubular strut for securement thereto, and wood plank decking substantially coextensive with said rectangular frame seated on the upper angle transverse flanges, and means for securing said decking to said flanges.

4,223,630

JET BOAT REVERSING UNIT

Lloyd E. Keeney, 4950 Hatt Rd., Jackson, Mich. 49201

Filed Sep. 7, 1978, Ser. No. 940,282
Int. Cl.³ B63H *11/00*
U.S. Cl. 440—41 **7 Claims**



1. Reversing apparatus for a hydraulic jet marine drive having a steering nozzle pivotal about a substantially vertical axis adapted to discharge water along a flow axis through an outlet, a reversing nozzle inlet opening communicating with said steering nozzle and a reversing gate movably mounted upon the steering nozzle adapted to be selectively positioned within said outlet to direct water into said reversing nozzle inlet opening, a reversing nozzle mounted on the steering nozzle having an inlet communicating with the reversing nozzle inlet opening and an outlet having an axis of discharge, bearing means rotatably mounting said reversing nozzle on the steering nozzle about a pivot axis radially spaced from the steering nozzle axis whereby said discharge axis may be obliquely related to the flow axis of the steering nozzle, the improvement comprising reversing nozzle orienting means connected to said reversing nozzle and fixed with respect to the steering nozzle axis whereby pivoting of the steering nozzle about its axis pivots said reversing nozzle about its axis in the opposite direction to obliquely orient said discharge axis relative to the steering nozzle flow axis at a variable angle directly related to the extent of pivoting of the steering nozzle about its pivot axis whereby the turning reaction forces within the steering nozzle and reversing nozzle are complementary.

4,223,631

SAILING INDICATOR

Clarke M. Poad, 1499 Oak Ridge Rd., Neenah, Wis. 54956

Filed May 1, 1978, Ser. No. 901,449
Int. Cl.³ G01P *21/00*
U.S. Cl. 116—265 **8 Claims**

1. A sailing indicator for attachment to the sail of a boat, said indicator comprising:

(a) a base for securement to a sail,

(b) a spacing member extending outwardly from said base,

(c) and an elongated tail connected at its inner end portion with the outer end portion of said spacing member,

(d) said base forming means to lift the moving air away from the said sail and direct the air toward said tail during sailing,

(e) said air lifting means comprising an upper face on said base, said face being angled outwardly from said base in a downwind direction.

4,223,632

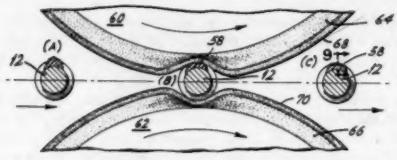
APPARATUS FOR MAKING SELF-LOCKING FASTENERS WITH A PRESSURE ROLLED THERMOPLASTIC PATCH

James W. Cadwallader, Lansdale, Pa., assignor to SPS Technologies, Inc., Jenkintown, Pa.

Division of Ser. No. 828,399, Aug. 29, 1977, Pat. No. 4,132,815, which is a continuation of Ser. No. 639,324, Dec. 10, 1975, abandoned. This application Jun. 19, 1978, Ser. No. 916,612

Int. Cl.[2] B05C *19/00*

U.S. Cl. 118—58 **5 Claims**



1. Apparatus for making a self-locking, externally threaded fastener of the type having a resilient, deformable patch of thermoplastic resin material fusion bonded to the thread surface, comprising:

means for supporting said fastener in a position with its longitudinal axis approximately horizontal;

means for heating said external thread surface to a temperature at least equal to the melting temperature of said thermoplastic resin material;

means for depositing said thermoplastic resin material in powder form on said heated external thread surface over a preselected circumferential extent less than 180° in an amount sufficient that the resin material extends above some portion of the fastener thread crests whereby said thermoplastic resin material is fusion bonded to said external thread surface; and

means for applying rolling pressure to said thermoplastic resin material to form said patch and to displace the excess resin material above the thread crests into the root areas of the threads to control and limit the radial height of the patch above the thread crests within the normal envelope of the basic major diameter of the fastener thread, including a pair of rollers each having a circumferential surface juxtaposed one from the other, whereby the fastener is passed between said rollers and the thermoplastic material is rollingly contacted on the external surface thereof by one of said circumferential surfaces.

4,223,633

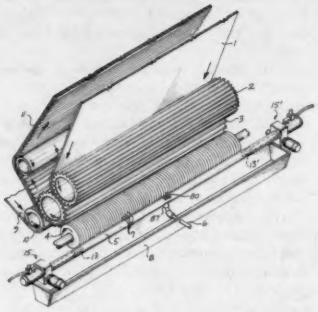
COATING APPLICATOR

Eric Alvensleben, Seattle, Wash.; Jay R. Ryan, Santa Paula, Calif., and Wayne C. Gaughran, Seattle, Wash., assignors to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 1, 1979, Ser. No. 16,639

Int. Cl.[2] B05C *1/00, 1/06*

U.S. Cl. 118—203 **19 Claims**



1. A fluid applicator system which is adjustable within limits defined by the edges of a relatively moving receiving surface of variable width which comprises:

(a) an apertured manifold tube;

(b) a supply of fluid to a central location of the manifold tube;

(c) a pair of opposed movable pistons within the manifold tube which act as seals at each end of the tube and define the number and position of apertures open to supply fluid to the receiving surface;

(d) drive means for controlling the location of the pistons along the axis of the manifold;

(e) the pistons also serving as purge means for expelling residual fluid from the manifold when the applicator is not in operation or to remove accumulated foreign materials having aperture-plugging tendencies.

4,223,634

DEVICE FOR THE APPLYING OF MELTED OR LIQUID DYES FOR THE INKING OF CUTTING EDGES

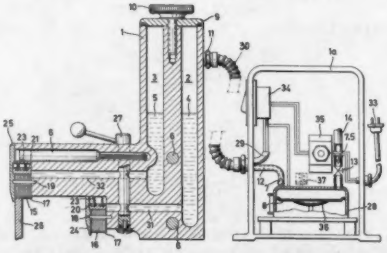
Heinz Gierse, Taunusstr. 33, 5 Koln 91, Fed. Rep. of Germany

Filed Nov. 22, 1976, Ser. No. 744,150

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1975, 2552390

Int. Cl.[2] B05C *1/02;* **F04B** *23/00*

U.S. Cl. 118—401 **2 Claims**



1. A marking device comprising in combination a storage tank for holding a quantity of liquid material, means yieldably mounting a plurality of lamella at the lower end of the storage tank for receiving said liquid material from the tank, said la-

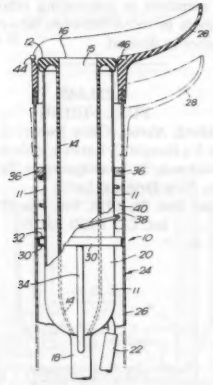
mella being operable by displacement when a workpiece is placed in engagement therewith to dispense liquid onto the workpiece, and vacuum-producing means for maintaining a constant vacuum within the storage tank with minimum volume flow, said vacuum-producing means comprising a pump chamber having inlet and outlet ports at one end of the pump chamber, first conductor means connecting the inlet port to the storage tank, second conductor means connecting the outlet port to the atmosphere, inlet and outlet check valves in said conductor means so arranged that when one is opened, the other is closed, a part in the pump chamber spaced from the one end and movable in one direction to induce air flow from the storage tank through the inlet valve into the pump chamber and in the other direction to discharge the air induced into the pump chamber from the storage chamber through the outlet valve from the pump chamber to the atmosphere, reciprocably movable power-operable means for effecting reciprocation of said part on the one hand to reduce the pressure between it and said one end of the pump chamber and on the other hand to increase the pressure between it and said one end of the pump chamber, and spring means yieldably connecting said part to said power-operable means, said spring means resisting relative movement between the part and the power-operable means in proportion to the change in pressure developed between the part and said one end of the chamber.

4,223,635

MILKING METHOD AND APPARATUS

David E. Akerman, Broad Lane Farm, Seend, Melksham, Wiltshire, England

Filed Nov. 13, 1978, Ser. No. 959,618
Claims priority, application United Kingdom, Nov. 12, 1977, 47199/77; Jan. 28, 1978, 3536/78
Int. Cl.³ A01J *5/04, 7/00*
U.S. Cl. 119—14.02 **13 Claims**



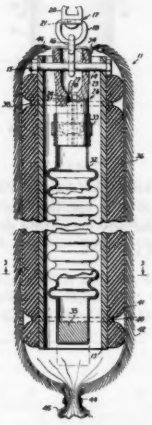
1. A method of placing a teat cup on a cow's teat, the teat cup having a hollow element with an opening into its interior at the top of the cup, and a milk outlet from the interior by which suction may be applied to the interior, characterised in that the cup has a teat supporting surface extending from the said opening to at least one side thereof, and characterised by the steps of moving the cup in an upright position against the teat, the direction of movement including at least a lateral component, and the supporting surface being in a trailing position relative to the lateral component, the movement lifting the lower parts of the teat, and being continued until the teat lays on the supporting surface with its tip over, or to the trailing side of, the said opening, and then moving the cup in the opposite lateral direction while applying suction to the cup interior, so that the teat is progressively drawn down through the said opening into the cup.

4,223,636

TRAINING LURE FOR RACING DOGS AND THE LIKE

Lester L. Dishong, P.O. Box 496, Highland, Calif. 92346

Filed Oct. 10, 1978, Ser. No. 949,949
Int. Cl.³ A01K *15/00*
U.S. Cl. 119—29 **3 Claims**



1. A training lure for a racing animal comprising
a hollow cylinder having sufficient strength to prevent collapse by said animal,
an elongate support member extending transversely through said cylinder adjacent one end of said cylinder,
suspending means attached to said support member for supporting said cylinder in a vertical position,
an air actuated sound producing device supported by said support member within said cylinder,
an elongate resilient bellows within said cylinder,
said bellows being secured at the upper end thereof to said sound producing device in communication with said device,
said cylinder guiding said bellows for lengthwise movement,
weighted means at the lower end of said bellows for causing extension and contraction of said bellows upon vertical shaking movement of said lure whereby to force air through said device,
a casing of resilient compressible material surrounding said cylinder, and
a flexible skin surrounding said casing,
said skin being effective to withstand abuse by said animal and said resilient material being compressible when said lure is struck by said animal.

4,223,637

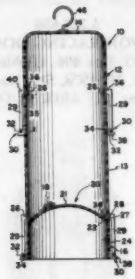
BIRD FEEDER

Harry Keefe, 42 Clapboard Ridge, Danbury, Conn. 06810

Filed Oct. 30, 1978, Ser. No. 956,252
Int. Cl.³ A01K *39/00*
U.S. Cl. 119—52 R **26 Claims**

1. A bird feeder comprising:
a hollow container having an upstanding sidewall;
at least one laterally outwardly opening feed aperture in said sidewall for emitting bird feed; and
a perch for birds movable between a laterally, outwardly projecting position, so that birds can roost thereon, and an upstanding position, alongside a portion of said sidewall;
said perch including plug means, receivable by said opening,

for closing said aperture when said perch is in said upstanding position;



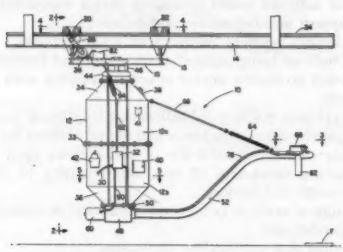
said perch being swingably mounted on said container, at a level below said feed aperture, for swinging movement between said laterally outwardly projecting position and said upstanding position.

4,223,638

APPARATUS FOR FEEDING POULTRY

Marr D. Sappington, and John Katinsky, both of Rte. 2, Box 24, Hurlock, Md. 21643

Filed Jan. 24, 1979, Ser. No. 6,110
Int. Cl.[3] A01K *5/00*
U.S. Cl. 119—52 B **17 Claims**



1. A poultry feeding apparatus, comprising:

a feed hopper having wheel means for supporting said hopper on a track;

first motor means coupled to said wheel means for moving said hopper on said track;

screw conveyor means for conveying feed from said hopper to feed trays positioned outside said hopper in a feeding region, a handle being formed at an outlet of said screw conveyor means to enable manual positioning of said conveyer means outlet over said feed trays;

second motor means for rotating said screw conveyer means; and

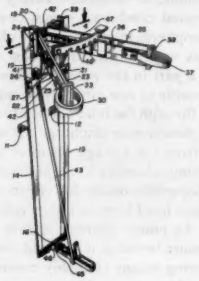
electrical switch means positioned at said outlet handle for selectively connecting said first and second motor means to a source of electrical power to control movement of said feed hopper on said track as well as discharge of feed from said outlet.

4,223,639

ANIMAL RESTRAINING DEVICE

James F. Korkowski, Brandon, Minn. 56315

Filed Dec. 7, 1978, Ser. No. 967,201
Int. Cl.[2] A61D *3/00*
U.S. Cl. 119—98 **18 Claims**



1. An animal restraining device comprising:

(a) a frame;

(b) a pair of support arms pivotally mounted upon said frame for pivotal swinging movement about at least one vertical axis and each extending horizontally outwardly from said frame in spaced relation at approximately the same elevation;

(c) a pair of size-adjustable closed loop members, one each of which is carried by the outer end portions of one of said arms and extends outwardly therefrom;

(d) each of said loop members being shiftable relative to its said associated outer end portion between restraining and non-restraining sizes; and

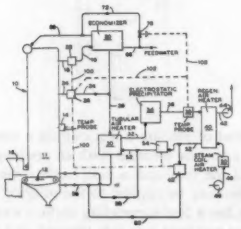
(e) control means carried by said frame and connected to said loop members in controlling relation to cause said loop members to move between non-restraining and restraining sizes as desired.

4,223,640

FUEL FIRING

Robert S. Rochford, Akron, Ohio; Robert S. Leckonby, Highland Mills, N.Y.; Ronald C. Lutwen, Akron, Ohio, and Gerald A. Cymny, Mahwah, N.J., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 21, 1978, Ser. No. 971,965
Int. Cl.[3] F22B *33/00*
U.S. Cl. 122—1 R **10 Claims**



1. In combination with a vapor generator having a furnace for burning fuels of varying moisture content, an apparatus for preheating air required for combustion and comprising conduit means defining an air and a flue gas flow path to and from the furnace, respectively, and economizer disposed in the gas flow path for preheating feedwater for the vapor generator, spaced first and second air heaters disposed downstream gas flow-wise

of the economizer and communicating with the air and gas flow paths to heat the air through indirect heat exchange with the gas, the second air heater being disposed upstream air flow-wise and downstream gas flow-wise of the first air heater, means for regulating the air temperature including conduit means defining an air flow path by-passing the first air heater and a gas flow path by-passing the economizer, damper means for apportioning the flow of air between the first air heater and the by-pass air flow path and damper means for apportioning the flow of gas between the economizer and the by-pass gas flow path in response to changes in flue gas temperature resulting from changes in fuel moisture content.

9. A method for burning fuels of varying moisture content, and including a vapor generator furnace, an economizer for preheating feedwater for the vapor generator through indirect heat exhange with flue gas, spaced first and second air heaters for preheating combustion air in indirect heat exchange with flue gas, and conduit means for by-passing flue gas around the economizer and combustion air around the first air heater, which comprises the steps of:

(a) detecting changes in flue gas temperature resulting from changes in fuel moisture content,

(b) increasing the flue gas portion by-passing the economizer and decreasing the combustion air portion by-passing the first air heater in response to an increase in fuel moisture content, and

(c) decreasing the flue gas portion by-passing the economizer and increasing the combustion air portion by-passing the first air heater in response to a decrease in fuel moisture content.

4,223,641

GAS BOILER CONTROL

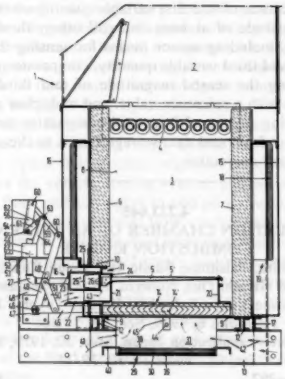
Louis H. Widdershoven, Kerkrade-West, Netherlands, assignor to Raypak Produkten B.V., Kerkrade-West, Netherlands

Filed Jul. 7, 1978, Ser. No. 922,729

Claims priority, application Netherlands, Jul. 11, 1977, 7707693

Int. Cl.[2] F22B *37/42*

U.S. Cl. 122—448 R **8 Claims**



1. A gas-fired boiler installation with control of supply of combustion components comprising, in combination: a boiler flue; combustion space that upwardly is in communication with said boiler flue, the bottom side of said combustion space being confined by a burner bed having atmospheric burners horizontally positioned with interposed venturi tubes, which upon throughflow by the gas controllably supplied via a single valve, draw in primary air, and wherein, between the elements of the burner bed, from the bottom side thereof, secondary air can be drawn into the combustion space; and control means for variably controlling supply of secondary air in conjunction with variably controlling gas supply control, said control means for controlling supply of secondary air in conjunction with gas supply control including control adjustment means for said gas valve through which the gas is supplied, control adjustment means for a control valve for the secondary air and a driving unit, each of said control adjustment means being connected to said driving unit; whereby excess of air upon loads smaller than those at maximal capacity and their cooling affects are avoided.

4,223,642

METHOD FOR IMPROVING THE COMBUSTION EFFICIENCY OF HYDROCARBON FUEL IN THE INTERNAL COMBUSTION ENGINE

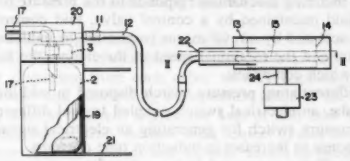
Yoshinori Okubo, 5-21, Kentoku-machi 1-chome, Oita-shi, Oita-ken, Japan

Filed Dec. 1, 1977, Ser. No. 856,431

Claims priority, application Japan, Dec. 15, 1976, 51/151420

Int. Cl.[3] F02B *43/08, 43/10*

U.S. Cl. 123—1 A **15 Claims**



1. A device for improving the combustion efficiency of hydrocarbon fuel in an internal combustion engine of a motor vehicle comprising:

an airtight container containing a solid ammonium compound which is capable of producing ammonia gas,

an ammonia gas flow-out passage having one end disposed in said container for conducting ammonia gas from said container,

a conducting flow passage having an intermediate portion communicating with said ammonia gas flow-out passage, said conducting flow passage having its downstream end connected with a fuel stream of said internal combustion engine by means of a heat-resistant tube, said heat-resistant tube has one end joined to a circular tube which has a plurality of equidistant openings open to the inside of an air cleaner of said internal combustion engine, said conducting flow passage having its upstream end open to atmosphere to receive on-coming air as the motor vehicle moves forwardly,

an air introduction conduit leading to said container, said air introduction conduit having its upstream end open to atmosphere to receive on-coming air as the motor vehicle moves forwardly, whereby the air in said air introduction conduit flows to said container to increase the air pressure within said container in proportion to the forward moving speed of the motor vehicle resulting in air movement within the container promoting the production of ammonia gas from said solid ammonium compound, and

venturi means at said intermediate portion of said conduction flow passage, said venturi means receiving said on-coming flow of air to induce flow of ammonia gas from said container into said conducting flow passage and thence to said fuel stream.

4,223,643
METHOD AND APPARATUS FOR FUEL MIXTURE ENRICHMENT DURING ACCELERATION

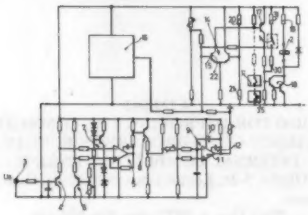
Otto Glöckler, Renningen; Harro Herth, Schwieberdingen; Thomas Wilfert, Markgröningen, and Bernd Kraus, Gerlingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 16, 1978, Ser. No. 878,505

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1977, 2707411

Int. Cl.[3] **F02B** *3/00;* **F02M** *39/00*

U.S. Cl. 123—492 **9 Claims**



1. An apparatus for changing the ratio of the fuel-air mixture fed to an internal combustion engine, said engine including an induction tube and a continuous fuel injection system in which a fuel metering mechanism responds to the pressure of a control fluid maintained by a control valve, said control valve being actuated by circuit means responsive to induction tube pressure and the rotational speed of the engine, the improvement which comprises:

a differentiating pressure switch disposed in said induction tube, an electrical switch coupled to said differentiating pressure switch for generating an electrical signal in response to increases in induction tube pressure,

an oscillator connected to a source of power to provide a wave shaped output signal,

a comparator circuit responsive to the wave shaped output signal of the oscillator and having an output,

a first transistor connected to said source of power to provide a current path and responsive to said comparator, said electrical switch being disposed in said current path and

a power transistor controlled by said first transistor for actuating said control valve so that upon acceleration of the engine, the fuel-air mixture is enriched.

4,223,644
METHOD AND APPARATUS FOR CONTROLLING OPERATIONAL VARIABLES OF AN INTERNAL COMBUSTION ENGINE

Reinhard Latsch, Vaihingen; Peter J. Schmidt, Schwieberdingen, and Josef Wahl, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 13, 1978, Ser. No. 960,271

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1977, 2750470

Int. Cl.[3] **F02B** *3/00;* **F02M** *7/00*

U.S. Cl. 123—489 **16 Claims**

1. A method for controlling the magnitude of a first variable quantity associated with the operation of an internal combustion engine, comprising the steps of:

defining the magnitude of said first variable quantity in a first rough approximation (λO);

data storage means containing data representing a second approximation correcting value;

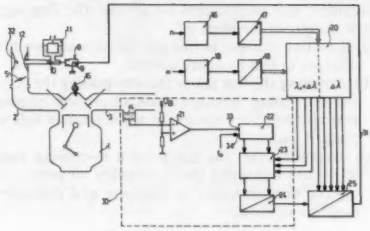
correcting the magnitude of said first variable quantity in a second approximation, more accurate than said first approximation, on the basis of the magnitude of at least one variable engine operation parameter received by said data storage means containing data (Δλ) being a difference between said first approximation and said second approximation;

providing a closed loop feedback signal based on a third variable quantity associated with the operation of said engine; and

correcting on a third approximation only said second approximation correcting value by said closed loop feedback signal, said feedback signal being multiplied with other data derived from said data storage means upon receipt of said at least one variable engine operation parameter.

7. An apparatus for controlling the magnitude of a first variable quantity associated with the operation of an internal combustion engine, comprising:

basic control means for defining the magnitude of said first variable quantity in a first approximation;



first correction means for applying a first correction to the magnitude of said first variable quantity on the basis of the magnitude of at least one other, second variable quantity, said first correction means including sensor means for sensing the magnitude of said at least one other, second variable quantity, data storage means for storing the same, final control means for engaging said basic control means to thereby effect said first correction; and

feedback control means for applying a second correction to the magnitude of said first variable quantity on the basis of the magnitude of at least one still other, third variable quantity, including sensor means for sensing the magnitude of said third variable quantity, comparator means for comparing the sensed magnitude of said third variable quantity with a reference value, and multiplier means for multiplying the signal from said comparator means with the output from said data storage means to thereby effect said second correction.

4,223,645
COMBUSTION CHAMBER OF AN INTERNAL COMBUSTION ENGINE

Hidetaka Nohira, Mishima; Sumio Ito; Teruo Kumai, both of Susono, and Hisashi Oki, Numazu, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jul. 6, 1979, Ser. No. 55,364

Claims priority, application Japan, Mar. 30, 1979, 54-037919

Int. Cl.[2] **F02B** *19/10, 19/16*

U.S. Cl. 123—292 **14 Claims**

1. An internal combustion engine comprising:

a cylinder block having a cylinder bore therein;

a cylinder head mounted on said cylinder block and having a cavity therein;

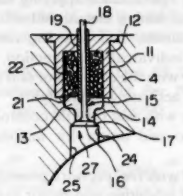
a piston reciprocally movable in said cylinder bore;

a combustion chamber formed between said cylinder head and said piston, said cavity having a port which is connected to said combustion chamber and containing a catalytic material therein for reforming a suction gas in said cavity;

an intake valve movably mounted on said cylinder head for leading the suction gas into said combustion chamber;

an exhaust valve movably mounted on said cylinder head for discharging exhaust gas into the atmosphere, and;

a valve means for opening said port of the cavity during the compression stroke to spout out a jet of the reformed suction gas under pressure into said combustion chamber from said cavity during the first half of the compression stroke.

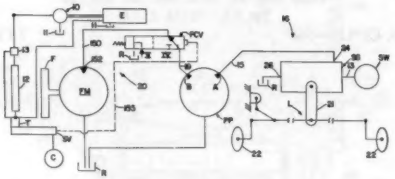


4,223,646

HYDRAULIC FAN DRIVE SYSTEM

Mark R. Kinder, Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Feb. 16, 1978, Ser. No. 878,564
Int. Cl.³ F01P *7/02*; F16D *31/02*
U.S. Cl. 123—41.11 **7 Claims**



1. Apparatus for driving a fan which directs air flow through a vehicle cooling system, said apparatus comprising a pump, a rotary hydraulic motor in fluid communication with said pump and having an output shaft drivingly connected with the fan, a pilot operated flow control valve in fluid communication with said pump and said rotary hydraulic motor, conduit means for directing fluid from said pump through said pilot operated flow control valve to said rotary hydraulic motor, means for providing a pilot fluid pressure signal in response to the temperature of the vehicle cooling system, means for conducting said pilot fluid pressure signal to said pilot operated flow control valve, said pilot operated flow control valve being operable in response to said pilot fluid pressure signal to control fluid flow from said pump to said rotary hydraulic motor, and said pilot operated flow control valve including means for modulating flow to said rotary hydraulic motor in response to the pressure of fluid flowing therethrough and for restricting flow to said rotary hydraulic motor at a predetermined level of pressure of the fluid flowing through said pilot operated flow control valve.

4,223,647

SLANTED INTERNAL COMBUSTION ENGINE

Armand Castarède, Meudon la Forêt, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

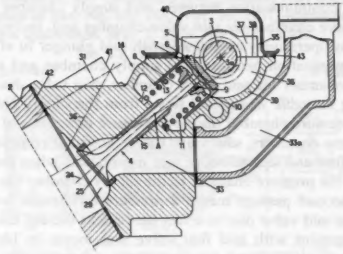
Filed Oct. 2, 1978, Ser. No. 947,319
Claims priority, application France, Oct. 5, 1977, 77 30011
Int. Cl.³ F02L *1/26*
U.S. Cl. 123—59 A **5 Claims**

1. An internal combustion engine, comprising

a plurality of in-line cylinders having axes which lie in a common plane which is sharply inclined with respect to the vertical,

a cylinder head having an exposed lower surface spaced from said cylinders, said head having for each cylinder an intake passage and an exhaust passage, said intake and exhaust passages leading outwardly from the cylinders to the exposed lower surface of the cylinder head,

a single overhead camshaft parallel to said common plane of the cylinder axes, said camshaft having a rotational axis which is offset above the said common plane of the cylinder axes,



an intake valve and an exhaust valve for controlling said intake and exhaust passages of each cylinder, said valves being directly actuated along their respective axes by said camshaft,

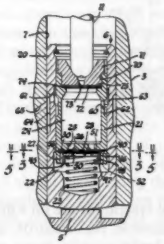
said valves lying in mutually parallel planes which are perpendicular to said camshaft axis, said valves of each cylinder diverging from each other as they approach their cylinder and intersecting the common plane of the cylinder axes at different angles, the axes of said inlet valves being more sharply inclined with respect to said common plane than the axes of said exhaust valves inclined with respect to said common plane.

4,223,648

HYDRAULIC VALVE LIFTER

Donald J. Pozniak, Utica, and Ronald J. Herrin, Clawson, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 1, 1978, Ser. No. 965,281
Int. Cl.³ F01L *1/34*
U.S. Cl. 123—90.16 **4 Claims**



1. In a hydraulic valve lifter of the type including a cylinder member with a plunger slidable therein to define therewith a pressure chamber separated by an end wall of the plunger intermediate the ends thereof from a supply chamber in the plunger, the end wall having an apertured passage means extending axially therethrough and a spring to normally bias the plunger relative to the cylinder member in a direction to increase the effective length of the lifter, the improvement

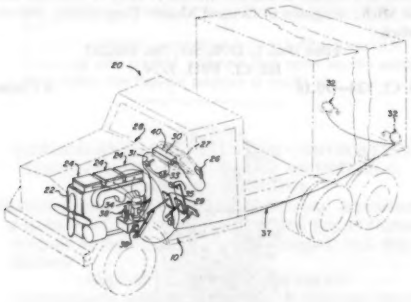
comprising an annular first valve seat means and an annular second valve seat means on said end wall radially inboard and outboard, respectively of said apertured passage means and extending toward said pressure chamber; a valve disc retainer slidably positioned in said plunger between said end wall and said spring which defines with said end wall of said plunger a variable volume valve chamber; said valve disc retainer having a central aperture therethrough; a thin plate flexible valve disc, with a central orifice passage therethrough movably located in said valve chamber for movement relative to said first valve seat means and said second valve seat means; said orifice passage and said central aperture defining a first passage means for flow communication between said supply chamber and said pressure chamber via said valve chamber and, second passage means operatively associated with said plunger to effect flow communication between said supply chamber and said pressure chamber via said valve chamber, said valve disc retainer being movable when fluid flows from the supply chamber to the pressure chamber due to a pressure difference of the fluid in these chambers, said valve disc is unseated relative to both said first and second valve seat means, and when fluid flows from the pressure chamber to the supply chamber via said first and second passage means a pressure differential will occur across said valve disc to effect movement thereof into seating engagement with said first valve seat means to block flow through said second passage means whereby the pressure differential across said valve disc can then be increased sufficiently whereby to effect flexing on said valve disc into seating engagement with also said first valve seat means thereby blocking flow through said first passage means to thereby trap the fluid in the pressure chamber so as to prevent movement of the plunger in a direction to shorten the effective length of the lifter.

4,223,649

MOTOR BRAKE CONTROL SYSTEM

Charles E. Robinson, Livermore, Colo. 80536, and Melvin Nieberger, 1203 Cypress, Ft. Collins, Colo. 80521

Filed Jun. 1, 1976, Ser. No. 691,724
Int. Cl.[2] F02D *17/00, 13/04, 17/01*
U.S. Cl. 123—319 **23 Claims**



1. A brake control system for use on a motor having a motor brake retarder, a throttle fuel control, and a fuel delivery system, said motor brake retarder being capable of retarding said cylinders of said motor, said system comprising:

means cooperative with said motor for determining the speed of said motor,

means operative with said determining means for activating said retarder when the speed of said motor exceeds a predetermined high RPM speed,

means operative with said determining means for deactivating said retarder when the speed of said motor drops below a predetermined low RPM speed,

means for manually selecting which of said cylinders are to be retarded by said brake,

means operative upon said manual selection for enabling said brake to retard only the selected cylinders,

means manually operable for applying said retarders in the event said determining means, said activating means, said deactivating means, said selecting means, and said enabling means individually malfunction,

means operative with the enabling of said enabling means for automatically activating brake lights,

means operative with said throttle control permitting delivery of fuel to said motor for inhibiting said enabling means, and

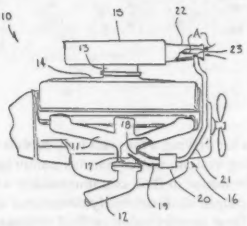
means operative with fuel pressure present in said fuel delivery system for inhibiting said motor brake retarders from activating.

4,223,650

EXHAUST GAS RECYCLING SYSTEM

Sumter Herbert, 379 Beech St., Pottstown, Pa. 19464

Filed Aug. 16, 1978, Ser. No. 934,220
Int. Cl.[3] F02M *25/06*
U.S. Cl. 123—568 **1 Claim**



1. An exhaust gas recycling system, comprising in combination:

an internal combustion engine having an exhaust manifold and an inlet manifold;

a carburetor on the inlet manifold;

an air cleaner housing on the carburetor and having a tubular air intake horn;

a first one-piece bypass pipe connected to the exhaust manifold and having one end thereof terminating in the plane of an opening in the exhaust manifold and having a baffle thereon projecting through the opening into the manifold for directing exhaust gases into the bypass pipe;

a silencer connected to the other end of the first bypass pipe; and

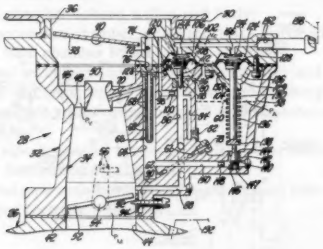
a second one-piece bypass pipe joined at one end thereof to the silencer and extending at its other end into an opening in the side of the air cleaning housing horn, the longitudinal axis of the other end of the second bypass pipe being perpendicular to the longitudinal axis of the horn, whereby air flowing through the horn creates a low pressure in the bypass pipes and draws exhaust gas through the pipes into the carburetor in direct proportion to the amount of air flowing thereinto, said first and second bypass pipes, baffle and silencer comprising the only elements added to the existing manifolds and carburetor.

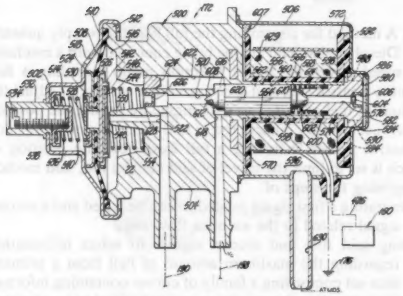
4,223,651

SOLENOID VACUUM CONTROL VALVE MEANS AND APPARATUS AND SYSTEM FOR CONTROLLING THE AIR-FUEL RATIO SUPPLIED TO A COMBUSTION ENGINE

Philip V. Eshelman, Southfield, and Ronald E. Herman, Romeo, both of Mich., assignors to Colt Industries Operating Corp, New York, N.Y.

Continuation of Ser. No. 863,740, Dec. 23, 1977, abandoned.
This application Feb. 6, 1979, Ser. No. 9,558
Int. Cl.[3] F02M 11/00
U.S. Cl. 123—438 51 Claims





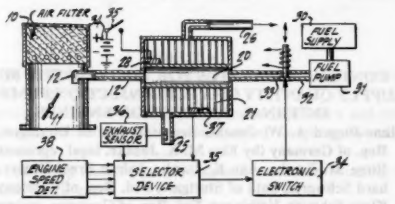
1. In combination with a carburetor for a combustion engine wherein said carburetor comprises induction passage means for supplying motive fluid to said engine, a source of fuel, main fuel metering system means communicating generally between said source of fuel and said induction passage means, idle fuel metering system means communicating generally between said source of fuel and said induction passage means, selectively controlled modulating valving means effective to controllably alter the rate of metered fuel flow through each of said main fuel metering system means and said idle fuel metering system means, said modulating valving means being effective to so alter said rate of metered fuel flow in response to control signal means generated as a consequence of selected indicia of engine operation, said modulating valving means comprising housing means, first conduit means carried by said housing means for supplying an output fluid pressure of a variable and controlled magnitude to said fuel metering system means, second conduit means leading to a source of relatively low fluid pressure, third conduit means leading to a source of relatively high fluid pressure, valve means movable to at least two selected positions and effective when in a first of said selected positions to close communication as between said second and said first conduit means while completing communication between said first conduit means and said third conduit means, said valve means being effective when in a second of said selected positions to close communication as between said first conduit means and said third conduit means while completing communication as between said second conduit means and said first conduit means, and first and second calibrated restriction means, said first restriction means being in circuit with said second conduit means to control the rate of flow through said second conduit means when said valve means is in said second of said selected positions, and said second restriction means being in circuit with said third conduit means to control the rate of flow through said third conduit means when said valve means is in said first of said selected positions.

4,223,652

FUEL DELIVERY SYSTEMS

Xavier B. Budnicki, 117 Livingston Ave., Edison, N.J. 08817

Continuation of Ser. No. 855,155, Nov. 28, 1977, abandoned.
This application May 7, 1979, Ser. No. 36,413
Int. Cl.[3] F02B 33/00
U.S. Cl. 123—440 8 Claims



1. A fuel delivery system apparatus for use with an internal combustion engine, the combination therewith comprising:

(a) a fuel evaporator comprising a hollow chamber having an inlet port for receiving a liquid fuel, and an outlet port communicating with said inlet port, said hollow chamber surrounded by an outer heat chamber with a plurality of heat conducting fins coupled about said inner chamber and located in said heat chamber, said heat chamber having an inlet port for receiving hot exhaust fumes from said engine and an outlet port for discharging said fumes, with said fumes operative to heat said fins and therefore said hollow chamber and any liquid fuel contained therein,

(b) temperature sensing means coupled to said outer heat chamber to monitor the temperature of operation of the evaporator,

(c) exhaust gas sensing means coupled to one of said ports of said heat chamber to monitor the pollutant content of said exhaust fumes,

(d) fuel supply means having an input conduit coupled to said inlet port of said hollow chamber for introducing fuel thereto,

(e) selective valve means located between said conduit and said inlet port and operative in a first position to allow fuel into said chamber and in a second position to restrain flow,

(f) speed detecting means coupled to said engine, said speed detecting means including a rotatable shaft coupled to said engine, said shaft having a cam projection on a surface thereof, a plurality of switches positioned about said shaft and operated by said cam projection during rotation of said shaft to provide a plurality of pulses at an output during each revolution of said shaft, said pulses indicative of a first control signal manifesting the speed of said engine, with the number of said pulses during each revolution always equal and independent of the speed of said engine,

(g) a first monitoring means responsive to said first control signal and coupled to said temperature sensing means to provide a first series of output pulses each of a given initial duration during engine start-up greater than that of said pulses indicative of said first control signal, with the duration of said pulses varying according to the temperature of said evaporator,

(h) a second monitoring means responsive to said first control signal, and coupled to said exhaust gas sensing means to provide a second series of output pulses each of a dura-

tion determined by said exhaust gas content, with an initial duration during engine start-up selected to be less than that duration of said pulses of said first monitoring means,

(i) means for combining said first and second pulse trains, to provide an output signal indicative of the wider of the two pulses during engine operation,

(j) means for coupling said output signal of said combining means to said selective valve means to control fuel flow in said chamber according to said output signal, whereby fuel entering said chamber via said inlet port is preheated by said chamber in an amount according to said operation of said selective valve means to provide preheated fuel at said outlet port for applying the same to the carbureator of said engine.

4,223,653

CONTROL APPARATUS FOR LIMITING THE FUEL SUPPLY QUANTITY OF A FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

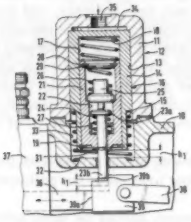
Hans-Jürgen A. W. Jaenke, deceased, late of Ditzingen, Fed. Rep. of Germany (by Else M. K. Jaenke, legal representative, Birge M. Jaenke, Ann K. Jaenke, heirs); Ernst Ritter; Reinhard Schwartz, both of Stuttgart, Fed. Rep. of Germany, and Klaus Schmidt, Vaihingen, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Mar. 7, 1979, Ser. No. 18,210

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1978, 2814146

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—366 **8 Claims**



1. A control apparatus for limiting the fuel supply quantity of a fuel injection pump for internal combustion engines such as Diesel engines or the like having a fuel supply quantity adjustment member comprising, in combination, a housing, a return spring, a first control member actuatable by the rpm-dependent pressure of a control medium, a limit stop having a starting detent displaceable against the force of said return spring and through said control member, said limit stop having one terminal position effected only by said return spring and arranged to assume a position which determines the starting position and having another terminal position controlled by the pressure of the control medium for determining the full-load position of said injection pump supply quantity adjustment member, said limit stop starting detent being arranged to vary its effective length in accordance with temperature, a full-load stop which limits the full-load position of said fuel supply quantity adjustment member when the engine is running and which releases the starting position of said fuel supply quantity adjustment member when the engine is stopped or is starting, said starting detent being arranged to limit the position of said fuel supply quantity adjustment member independently of the setting of said full-load stop when the operationally warm engine is starting to a starting position which does not exceed the full-load position.

4,223,654

METHOD AND APPARATUS FOR CONTROLLING THE OPERATION OF A DIESEL ENGINE

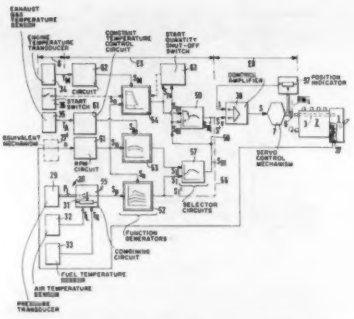
Wolf Wessel, Oberriexingen; Wilfried Sautter, Ditzingen; Gerhard Engel, and Gerhard Stumpp, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 31, 1977, Ser. No. 847,365

Claims priority, application Fed. Rep. of Germany, Nov. 2, 1976, 2650247

Int. Cl.² F02M *51/06*

U.S. Cl. 123—358 **33 Claims**



1. A method for controlling the full load fuel supply quantity to a Diesel engine, said engine being equipped with a mechanical speed governor, a fuel injection pump including a fuel quantity control rod, said speed governor serving to adjust the amount of fuel admitted to said engine by setting the position of the fuel quantity control rod in said fuel injection pump, and a control system including a full load stop, the position of which is set to limit the travel of said control rod, said method comprising the steps of:

generating a first signal related to engine speed and a second signal related to the air mass flow rate;

using said first and second signals to select information regarding the maximum amount of fuel from a primary data-set comprising a family of curves containing information regarding the maximum amount of fuel to be admitted to said engine by the fuel injection pump at full load for a given engine speed and for a given air mass flow rate into said engine; and

applying said information to the control system to thereby set the position of said full load stop;

whereby the full load operation of said engine is operated at optimum efficiency.

4,223,655

DEVICES FOR REGULATING THE DELIVERY OF FUEL FROM AN INJECTION PUMP TO THE CYLINDER OF AN INTERNAL COMBUSTION ENGINE

Giulio Arietti, Turin, and Claudio Lombardi, Allessandria, both of Italy, assignors to Centro Ricerche Fiat S.p.A., Orbassano, Italy

Filed Feb. 6, 1979, Ser. No. 9,620

Claims priority, application Italy, Mar. 9, 1978, 67503 A/78

Int. Cl.³ F02D *1/06*

U.S. Cl. 123—463 **2 Claims**

1. In an internal combustion engine comprising, in combination:

a plurality of cylinders;

an air induction manifold communicating with each said cylinder;

an air induction pipe upstream of said air induction manifold;

a throttle valve located within said induction pipe;

means for controlling said throttle valve;

a Venturi tube fitted to said induction pipe upstream of said throttle valve;

a fuel injection pump having a regulating component for regulating the fuel delivery of the pump;

means for feeding fuel to said fuel injection pump, and

means for delivering fuel from said injection pump to said cylinders:

a fuel delivery regulating device comprising:

a hollow support body;

first and second diaphragms located in the cavity of said hollow support body and fixed peripherally to the inner wall of said body;

a main chamber defined within said body;

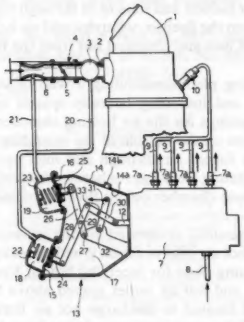
a first secondary chamber within said body and divided from said main chamber by said first diaphragm;

a second secondary chamber within said body and divided from said main chamber by said second diaphragm;

vent aperture means connecting said main chamber with the outside;

a first pipe connected between said induction manifold and said first secondary chamber;

a second pipe connected between said Venturi tube and said second secondary chamber;



a pair of helical coil springs, each placed in a respective said secondary chamber and acting, in a direction perpendicular to a respective said diaphragm and the wall of a respective said secondary chamber; and

mechanical transmission means between each of said diaphragms and said regulating component, whereby said regulating device governs said regulating component in response to variations in pressure in said induction manifold and in said Venturi tube, said mechanical transmission means comprising:

first and second supports fixed to the first and second diaphragms respectively so as to project from said diaphragms into said main chamber;

a first lever pivotally mounted on said hollow support body and articulated at one end to said second support;

a second lever pivotally mounted to said first lever and articulated at one end to said first support;

a third lever articulated at one end to the other end of said second lever and at the other end to said regulating component, and

manually operable means for direct manual regulation of said regulating component, said manually operable means comprising a fourth lever pivotally mounted to said support body and cooperating with one of the other said levers.

4,223,656

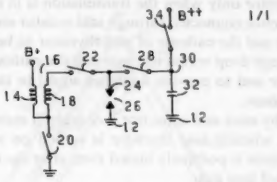
HIGH ENERGY SPARK IGNITION SYSTEM

James P. Hamley, Crystal Lake, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 27, 1978, Ser. No. 955,552

Int. Cl.³ F02P *3/06*

U.S. Cl. 123—598 **12 Claims**



1. An ignition system for producing a timed arcing potential across a spark gap comprising:

ignition coil means having predetermined primary and secondary windings and predetermined coupling therebetween;

coil coupling means for coupling said secondary winding to said spark gap;

means for producing a current through said primary winding;

means for interrupting said primary current at the desired time or arcing such that an arcing potential appears across said spark gap;

predetermined value capacitor means;

power supply means for charging said capacitor means to a voltage at least as great as the sustaining voltage of said spark gap, said power supply means being responsive to at least one external parameter to control the voltage across said capacitor; and

means for coupling said charged capacitor means across said spark gap upon initial arcing thereof caused by said coil such that stored energy in said capacitor causes an increased time duration of spark gap arcing over that otherwise produced by said coil.

4,223,657

SAFETY DEVICE FOR CONTROLLING AN IGNITION CIRCUIT

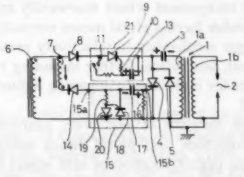
Hiroo Sato, Susono; Yoshihiko Ikeda, Shizuoka, and Mitsuo Katsumata, Susono, all of Japan, assignors to Kokusan Kenki Co., Ltd., Numazu, Japan

Filed Mar. 8, 1978, Ser. No. 884,649

Claims priority, application Japan, Mar. 14, 1977, 52-30720[U]

Int. Cl.³ F02N *15/10*; B60K *41/04*

U.S. Cl. 123—179 K **9 Claims**



1. A safety device for controlling an ignition circuit for an internal combustion engine associated with a transmission coupling the engine to a load, the ignition circuit including a power supply and at least one ignition coil having a primary and a secondary winding producing a high voltage to fire a

spark plug provided in the engine, said safety device comprising:

a thyristor adapted to permit the ignition circuit to produce the high voltage only when said thyristor is conductive,

a position-responsive switch,

resistor means connecting said switch across the anode and the gate of said thyristor to permit the application of a trigger signal from said power supply to the gate of said thyristor only when the transmission is in neutral, and

a capacitor connected through said resistor means across the gate and the cathode of said thyristor to be charged by a voltage drop across the gate and the cathode of said thyristor and to provide a trigger signal to the gate of said thyristor,

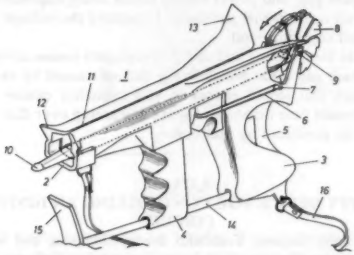
whereby once said capacitor is charged it maintains a condition wherein said thyristor is turned on whenever said thyristor is positively biased even after the transmission is shifted into gear.

4,223,658

ELASTIC BAND PROJECTING TOY GUN

Paul Sundstrom, 53 Barney St., Gladstone, Queensland, 4680, Australia

Filed Jul. 13, 1978, Ser. No. 924,190
Claims priority, application Australia, Jul. 18, 1977, PD0883
Int. Cl.[3] F41B *7/02*
U.S. Cl. 124—19 **8 Claims**



1. A toy gun capable of propelling a plurality of elasticized band projectiles singly or in rapid succession comprising:

an elongate body member including forward and rearward ends and a projectile path therebetween;

a biased trigger mechanism mounted on said body member;

a rotatable escapement wheel rearwardly mounted on said body member having plural means normally engaged with said trigger mechanism to selectively prevent rotation of said wheel, said wheel further including radially extending means for individually engaging a plurality of projectiles; and

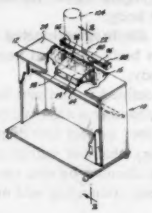
a projection forward of said body adapted to releasably retain projectiles, said plural means being positioned to selectively permit rotation of said wheel to successively expel projectiles stretched between said projection and said wheel along said path, said wheel comprising a plurality of spaced apart radially extending sections having successively increasing radii around substantially the entire outermost periphery of the wheel (all the sections) and said wheel being biased by projectiles, when loaded, in a direction counter to the direction of increasing radius.

4,223,659

FORCED AIR HEATER

David J. Livezey, Kent, Wash., assignor to Therm - Air Industries, Inc., Seattle, Wash.

Filed Jul. 1, 1977, Ser. No. 812,322
Int. Cl.[2] F24H *3/08*
U.S. Cl. 126—66 **6 Claims**



1. For use with a stove having a firebox and a rear side opening providing access into such firebox, a forced air heater comprising:

a mounting plate connectible to the stove, to extend over said rear side opening;

an air heating chamber connected to the mounting plate in cantilever fashion and sizes to fit through said opening and project into the firebox, whereby said air heating chamber is inserted into and removed out from the firebox via said opening;

said mounting plate constituting a wall of said air heating chamber and including laterally spaced apart inlet and outlet openings for the air heating chamber;

blower means on the outside of the mounting plate, serving to deliver forced air through said inlet opening and into the air heating chamber, wherein the air will circulate through said chamber before flowing to said outlet opening;

a hot air manifold connected to the mounting plate and having a hot air inlet in registry with the outlet opening in the mounting plate for receiving hot air from the heating chamber, and hot air outlet spaced above the top of the stove and located to discharge hot air horizontally over the top of the stove into space being heated by the stove; and wherein the mounting plate includes a flange along its perimeter having an outer edge projecting toward and forming a line contact with the side wall portion of the stove which borders said side opening, and mounting means for pressing said outer edge into tight contact with said side wall portion to provide a substantially airtight seal therebetween.

4,223,660

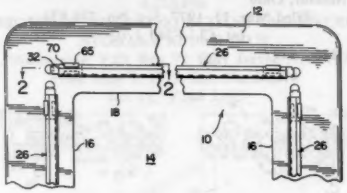
REMOVABLE OVEN DOOR GASKET

Ronald G. Lang, Eastlake, Ohio, assignor to The Stalwart Rubber Co., Bedford, Ohio

Filed Feb. 14, 1979, Ser. No. 11,789
Int. Cl.[3] F24C *15/02*
U.S. Cl. 126—190 **6 Claims**

1. A gasket for sealing the door of an oven relative to its supporting frame, said gasket being comprised of an elongated member of elastomeric material and a metal hook fastened to each end of said member, said member being generally T-shaped in cross-section with the top surface of the head of the T adapted to face and engage one surface of the oven and with the leg of the T adapted to resiliently engage another surface of the oven when the door is closed, said top being comprised of a pair of flanges, one on each side of said leg, said hook including a base portion abutting against a longitudinal portion of said top surface, and having a pair of ears, one extending around and tightly crimped over the end of each flange, said base portion having a cross-sectional shape conforming to the

cross-sectional shape of the top surface of the head of the T, said hook having a reversely bent portion extending away from



said surface and adapted to be inserted in an opening in one of the surfaces of the oven for retaining the gasket in position.

4,223,661

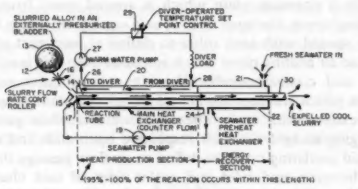
PORTABLE DIVER HEAT GENERATING SYSTEM

Sergius S. Sergev, 210 Grandridge Ct., Ventura, Calif. 93003; Stanley A. Black, P.O. Box 322, Port Hueneme, Calif. 93041, and James F. Jenkins, #268 2660 Peninsula Rd., Oxnard, Calif. 93030

Division of Ser. No. 855,035, Nov. 25, 1977, abandoned. This application Aug. 13, 1979, Ser. No. 66,201

Int. Cl.³ A16F *7/06*

U.S. Cl. 126—204 **10 Claims**



1. A portable heat generating system, suitable for use with a diver water circulation garment, comprising:

a. a reaction chamber having an inlet and an outlet;

b. a heat exchanger chamber separate from and surrounding said reaction chamber;

c. said heat exchanger chamber having separate first and second sections;

d. the first section of said heat exchanger chamber having an inlet and outlet thereto through which a heating fluid is circulated;

e. a source of supercorroding mechanically alloyed powder;

f. means for supplying a controlled amount of said supercorroding alloy powder from said source to the inlet of said reaction chamber;

g. the second section of said heat exchanger chamber having an inlet and an outlet through which fresh seawater is circulated for preheating;

h. means for supplying a controlled amount of preheated seawater from the second section of said heat exchanger to the inlet of said reaction chamber where said seawater is mixed with said supercorroding powder for reaction thereof and high generation of heat; the heat generated being substantially removed by the heating fluid and seawater circulated through said first and second chambers, respectively, of said heat exchanger chamber;

i. the cooled byproducts from the reaction of the seawater and supercorroding alloy powder being expelled from said reaction chamber outlet along with hydrogen.

4,223,662

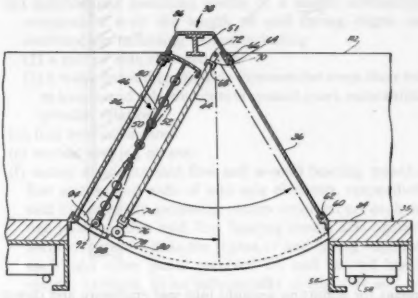
STRUCTURAL SOLAR COLLECTOR ASSEMBLY

Frithjof M. Lunde, Peekskill, and Calvin L. Wilbourne, New York, both of N.Y., assignors to Warner, Burns, Toan and Lunde, New York, N.Y.

Filed Mar. 20, 1978, Ser. No. 888,196

Int. Cl.³ F24J *3/02*

U.S. Cl. 126—424 **30 Claims**



1. A structural support assembly constituting a building enclosure system also used for collecting solar energy, regulating heat loss or gain and, permitting the passage of day light, and adapted to be interconnected with other structural elements to form a building, the assembly comprising:

Interconnected opposing side walls and a base forming a truss;

at least a portion of the side walls being transparent;

a solar collector assembly associated with one of the side walls, preferably one to be at a generally southern exposure when incorporated in a building in northern latitudes and vice versa in southern latitudes and being positioned to maximize solar gain;

an insulating/and reflecting panel associated with the other of the side walls, preferably one to be at a generally northern exposure when incorporated in a building in northern latitudes and vice versa in southern latitudes, and means for adjusting the panel with respect to the transparent portion of the other side wall to regulate the light received and heat loss or gain through the other side wall;

means for interconnecting the structural support assembly to other building structural elements.

4,223,663

CEILING MOUNTED SOLAR HEAT COLLECTOR

Leo G. Carmichael, 51 Herschell St., and Robert F. Carmichael, 14 Glenwood Cir., both of Lynn, Mass. 01902

Filed Oct. 12, 1978, Ser. No. 950,829

Int. Cl.³ F24J *3/02*

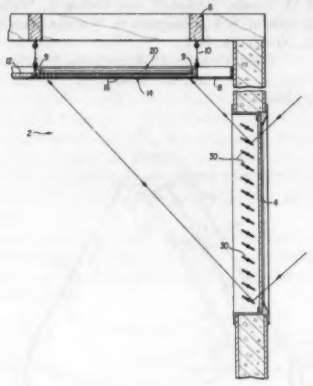
U.S. Cl. 126—426 **5 Claims**

1. A solar heat collecting and storing system comprising:

an enclosure having a ceiling, a portion of said ceiling being a removable grid of reflective louvers;

a waterproof bag of flexible material overlying and being supported by said grid and containing a heat absorbing

and storing material including water and Glauber's salt; and



means for admitting sunlight into said enclosure and directing the same to said grid to be reflected thereby to said bag.

4,223,664

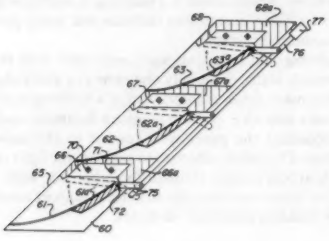
CONCENTRATING SOLAR HEAT COLLECTOR

Arthur P. Fattor, Englewood, Colo., assignor to Sun-Heet, Inc.,, Englewood, Colo.

Division of Ser. No. 824,569, Aug. 15, 1977, Pat. No. 4,173,214. This application Apr. 30, 1979, Ser. No. 34,382

Int. Cl.[3] F24J *3/02*

U.S. Cl. 126—438 **2 Claims**



1. A concentrating solar collector system of the reflecting type, comprising,

(a) a series of parabolic-trough reflecting surfaces mounted one generally above the other, and mounted at an angle to collect radiation from about 30° to 70° above the horizon and reflect generally upright rays into a line focus,

(b) target means superposed over each said reflecting surface arranged to be impinged on by said line focus,

(c) said target means including heat storage means,

(d) fluid conduit means extending through said storage means and in heat transfer contact therewith, and

(e) means for insulating said heat storage means in the absence of solar radiation, said means for insulating includes a portion of each of said series of reflecting surfaces, said portion being a section of said reflecting surface, said section being movable to cover that portion of the target upon which the focused rays impinge, said reflecting surface section further includes an insulation backing attached to the rear surface of each section and a means along one edge thereof for pivotal movement of the section into a closed position over said target means.

4,223,665

SOLAR HEATING SYSTEM

Leonard A. Lowe, Euclid, Ohio, assignor to Stellar Industries, Inc., Mentor, Ohio

Filed Mar. 11, 1977, Ser. No. 776,874

Int. Cl.[2] F24J *3/02*

U.S. Cl. 126—449 **1 Claim**

1. Apparatus for heating air comprising a solar energy collector unit including means defining an air heating chamber having an insulating cover which is positioned to face the sun and transmit solar energy therethrough, an array of solar energy collectors in said air heating chamber, said air heating chamber having an inlet side and an outlet side, said array of solar energy collectors extending axially between said inlet and outlet sides of said chamber and also extending transverse to the inlet and outlet sides of said chamber so that said array has a length extending between the inlet and outlet sides and a width extending between the inlet and outlet sides, each of said solar energy collectors comprising a conical member formed of heat conducting material, each conical member converging away from an open end which faces the insulating cover into which rays transmitted through the insulating cover can pass each conical member having an inner heat absorbent surface, the open ends of said conical members being generally disposed in a common plate which is spaced apart from said insulating cover, the open ends of said conical members being closely spaced with each other to define at least part of one side of an air heating plane which is spaced from said insulating cover, said conical members having conical outer surface portions which are disposed in said air heating plane in spaced apart relation with each other, said outer surface portions converging away from their respective open ends and away from said insulating cover to define an air flow passage thereabround between said inlet and outlet sides of said chamber across the width thereof for enabling free flow of air thereabround and through said air heating plane, means for circulating air through said air heating chamber including air inlet means having an air inlet opening through which cold air is forced into said air heating chamber and air outlet means having an air outlet opening through which heated air is drawn out of said air heating chamber, said air inlet opening means disposed in said air heating plane in alignment with the conical outer surface portions of said array of conical solar energy collectors at the inlet side thereof and extending substantially across the width of said array of solar energy collectors for directing a narrow stream of cold air to said inlet side of said array of solar energy collectors in said air heating chamber and in said air heating plane so as to direct the stream of air into contact with the conical outer surfaces of said conical members, said air outlet opening disposed in said air heating plane in alignment with the conical outer surface portions of said array of conical solar energy collectors at the outlet side thereof and extending substantially across the width of said array of solar energy collectors for conducting a narrow stream of heated air out of the air heating chamber in said air heating plane, means including said air inlet and outlet openings and said array of solar energy collectors for maintaining the air flow in said air heating plane between said inlet and outlet sides of said array of solar energy collectors and for maintaining the flow of air advancing in said air heating plane between the inlet and outlet sides of said array substantially across the entire width of the array of solar energy collectors so that the air flow through said air heating chamber and through said air heating plane contacts essentially only the outer surfaces of said conical

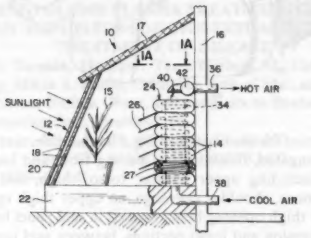
members and contacts the outer surfaces of substantially all of said conical members in said array.

4,223,666

TOROIDAL SOLAR COLLECTION AND ENERGY STORAGE APPARATUS

Kurt J. Wasserman, P.O. Box 77, Port Jervis, N.Y. 12771

Filed May 7, 1979, Ser. No. 36,874
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **30 Claims**



1. A solar energy heating system for cooperation with a space to which thermal energy is to be supplied, said system comprising:

an enclosure proximate said space, said enclosure having a generally translucent window area oriented for permitting entry of solar radiant energy into said enclosure;

a plurality of generally toroidal, substantially black, elastomeric, hollow, vehicular tire-like members within said enclosure located proximate each other and positioned relative to said window area so as to be heated by absorbing the solar radiant energy entering said enclosure through said window area;

heat storage media within said members; and

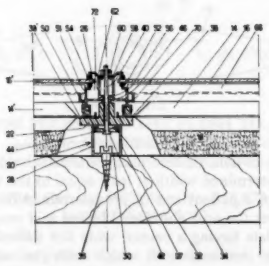
means, including fluid duct means interconnecting said enclosure to said space, for transferring the solar energy absorbed by said tire-like members to said space.

4,223,667

APPARATUS FOR SUPPORTING SOLAR COLLECTORS ON A BUILDING

André Paymal, Saint-Germain-en-Laye, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

Filed Aug. 10, 1978, Ser. No. 932,699
Claims priority, application France, Aug. 25, 1977, 77 25947
Int. Cl.³ F24J *3/02;* **E04D** *1/36*
U.S. Cl. 126—450 **17 Claims**



1. Apparatus for mounting panels of adjacent pairs of panels in spaced, overlying relation on a structure comprising:

(a) base mounting means including a rail and a plurality of blocks adapted for supporting one panel of each said adjacent pair of panels, said rail having a surface and an opening through said surface into a channel, and said blocks disposed on and along said surface;

(b) means fixedly mounting said rail on a series of structural members disposed in a parallel family toward the exterior of said structure, and each said one panel disposed on a respective surface of said blocks spaced from said structural members and substantially contiguous with their facing edges extending substantially perpendicular to said structural members;

(c) intermediate mounting means of a length substantially coextensive with the length of said facing edges, said intermediate mounting means including

(1) a pair of side elements and

(2) a web connecting said side elements between their ends to locate said side elements in spaced apart, substantially parallel relation;

(d) first bearing means;

(e) second bearing means;

(f) means mounting said first and second bearing means on first and second ends of said side elements, respectively, said intermediate mounting means received on each said one panel so that said first bearing means acts against a surface thereof within the region of said facing edges, and each said other panel received on said second bearing means, likewise, to be substantially contiguous and with their facing edges extending substantially perpendicular to said structural members;

(g) top cover means extending between said other panels along their facing edges and including side members projecting from said top cover means toward said other panels;

(h) third bearing means mounted on said side members for supporting said top cover means on said other panels, each said bearing means formed of a resilient, deformable material; and

(i) securing means extending through each said block, intermediate mounting means and top cover means for mounting the same, said securing means acting between the underside of said rail surface adjacent said opening within said channel and an outer surface of said top cover means whereby each said bearing means is moved into tight bearing relation with the surface with which it is in contact and wherein said second and third bearing means are of a length coextensive with the length of said edges of said other panels to form a seal toward the interior of said structure.

2. The mounting apparatus according to claim **1** wherein each pair of panels comprises a solar collector integrated with said structure and wherein each said one panel is an absorber panel and each said other panel is a transparent panel.

4,223,668

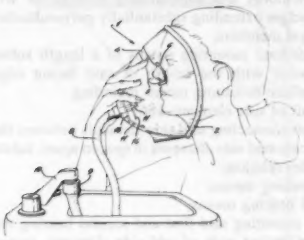
FACE MASSAGER

Noëlla Forget nee Lamy, and Maurice Forget, both of 5237 Louis Veuillot St., Montreal, Canada (H1M 2N4)

Filed Jul. 24, 1979, Ser. No. 60,159
Int. Cl.³ A61H *9/00*
U.S. Cl. 128—66 **4 Claims**

1. A cosmetic mask comprising a slightly flexible mask adapted to be fitted around the face of a user and generally in the shape of a cone; the rear periphery of the cone being provided with a flexible and compresible bead for watertight engagement of the mask with the top of the forehead, down along the back of the cheeks and across the neck to expose within the mask the face and upper part of the neck of a user, further comprising a nose-tube secured to and downwardly depending from the top wall of said mask, opening out on the top surface of said mask and flaring out at its lower end into a bulbous portion provided with a rearwardly facing lateral opening into which the nose of a user is inserted; the periphery of said lateral opening being provided with a second and compressible, flexible bead; a nipple attached at the front end apex of said mask, extending a short distance inside the cone, a hose

connected to said nipple and having means at its outer end for attachment to a standard water tap, a water-spraying assembly rotatably mounted on said nipple, communicating with said nipple and including at least one radial tubular branch having a transversely-directed nozzle at its outer end and adapted to



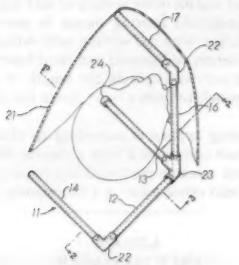
revolve inside the mask under the action of water issuing from the nozzle to spray water rearwardly into the mask not only onto the user's face and forehead but also under the chin and onto the upper portion of the neck, and further comprising a drainage means in the bottom surface of said mask.

4,223,669

SURGICAL DRAPE SUPPORT APPARATUS

Thomas E. Morledge, 208 Mountain View Blvd., Billings, Mont. 59101

Filed Oct. 26, 1978, Ser. No. 954,940
Int. Cl.[3] A61B *19/00*
U.S. Cl. 128—132 D **8 Claims**



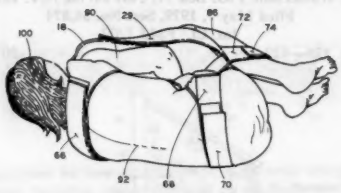
1. Surgical drape support appartus including a horizontal base frame having a longitudinal section, transverse sections extending from said longitudinal section adjacent the ends thereof, said transverse sections being disposed substantially perpendicular to said longitudinal section, a support section extending generally vertically from said longitudinal section adjacent one of said transverse sections, an upper section extending from said support section adjacent the free end thereof, said upper section extending generally horizontally from said support section substantially parallel to and above said transverse section closest thereto, said upper section and said support section having passages therethrough and a plurality of spaced openings along at least a portion of their lengths communicating with said passages, said openings being oriented toward the area circumscribed by and projected upwardly from said base frame, said apparatus including means for adapting said passages to a source of positive or negative air pressure.

4,223,670

RESTRAINT FOR USE IN PERFORMING A LUMBAR PUNCTURE

Judith C. Cramer, R.R. #1, Yoder, Ind. 46798

Filed Dec. 1, 1978, Ser. No. 965,292
Int. Cl.[3] A61F *13/00*
U.S. Cl. 128—134 **13 Claims**



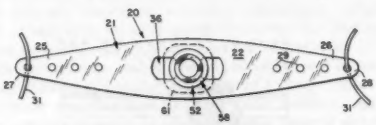
1. A restraint for use in performing a lumbar puncture procedure; an elongated, flexible panel having front and back surfaces and including upper tension, torso, thigh, and lower tension portions, shoulder openings, an upper thigh opening, and a lower thigh opening being formed in said panel between said upper tension and torso portions, between said torso and thigh portions, and between said thigh and said lower tension portions, respectively, laterally extending shoulder straps fixedly secured to said panel adjacent said shoulder openings, buttocks and shin straps fixedly secured to said panel in laterally extending, spaced-apart relationship adjacent said upper thigh opening, the restraint being placed on said patient with the back surface of said torso portion against the front of said subject's torso, the subject's thighs passing through said upper thigh opening from the back surface of said panel, over the front surface of said portion, and through said lower thigh opening in a direction from the front to the back surface of said panel, said buttocks and said shoulder straps being secured around subjects buttocks and shoulders, respectively, said shin straps being secured around the subject's shins securing same adjacent said patients thighs, said upper and lower tension panels being drawn together forwardly of said torso portion to draw the subject into a forwardly arched position and secured to thereby hold said patient immobilized in said forwardly arched position.

4,223,671

ENDOTRACHEAL TUBE STABILIZER

Rudolph Muto, 24 Williams St., Andover, Mass. 01801

Filed Mar. 26, 1979, Ser. No. 23,652
Int. Cl.[3] A61M *16/00*
U.S. Cl. 128—200.26 **11 Claims**



1. An endotracheal tube stabilizer comprising:

a faceplate of soft, flexible plastic material, said plate being of predetermined width at least equal to the width of the mouth of a patient and of predetermined height to abut and cover the area above and below said mouth;

said faceplate having a central wide slot therethrough substantially coextensive in width with the width of said mouth;

strand means on said faceplate, adapted to extend around the back of the head of a patient to firmly affix said faceplate over said mouth without the use of adhesive tape,

a tubular mouthpiece mounted in said slot for sidewise sliding movement from one side thereof to the other, said

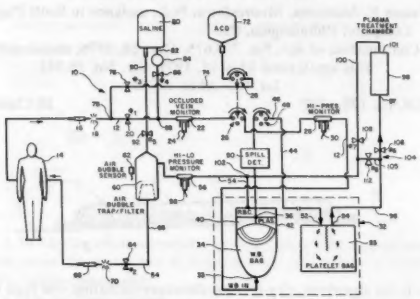
mouthpiece having an axial bore, extending generally normal to said faceplate, for, receiving an endotracheal tube and having a tubular portion projecting into the mouth to form a bite block, and means for retaining said mouthpiece in said slot.

4,223,672

VARIABLE VOLUME PLASMA TREATMENT CHAMBER FOR AN APPARATUS FOR THE EXTRACORPOREAL TREATMENT OF DISEASE

David S. Terman, Houston, Tex.; Herbert M. Cullis, Silver Spring; Mirza A. Khoja, Columbia, both of Md., and Michael R. Sullivan, Buffalo Grove, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 8, 1979, Ser. No. 10,232
Int. Cl.[2] A61M *5/00;* **B01D** *35/00*
U.S. Cl. 128—214 R **13 Claims**



1. In an apparatus for the extracorporeal treatment of diseases and of the type comprising means for withdrawing whole blood from a patient, means for separating plasma from the whole blood, means for treating the plasma including a chamber for receiving the plasma and a vehicle positioned within the chamber and having an immuno-adsorbent agent fixed thereon which will interact and bond with an immunological reactant carried by the plasma that is passed through the chamber, and means for recombining the substantially immunological reactant free plasma with the remainder of the whole blood and for returning the recombined whole blood to the patient, an improved means for treating the plasma including a variable volume plasma treatment chamber.

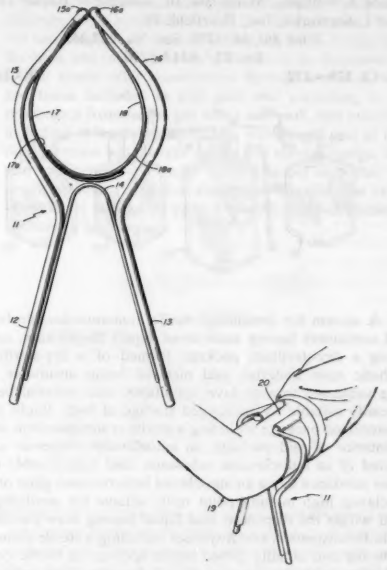
4,223,673

DEVICE FOR PUCKERING THE FLESH TO ASSIST IN INJECTIONS

William J. Harris, 129 Hampshire Rd., Wellesley Hills, Mass. 02181

Filed Oct. 11, 1978, Ser. No. 950,479
Int. Cl.[3] A61M *5/00*
U.S. Cl. 128—215 **4 Claims**

1. A device for puckering the flesh on a limb of a person to assist in injections, comprising a gripping portion; clamping means attached to said gripping portion and having a pair of parallel clamping arms; a flexible loop formed of a pair of overlapping, interlocking strips, said loop being adjustable in length by means of adjusting means which vary the amount of overlap of said pair of strips at a bottom portion thereof facing said gripping portion, each of said strips having one end attached to one of said clamping arms; and spring means attached to said gripping portion and tending to push said arms in an inward direction.

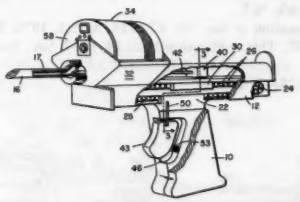


4,223,674

IMPLANT GUN

Stewart L. Fluent, Cedar Falls, Iowa, and Dan R. Foley, La-Verne, Calif., assignors to Arthur J. McIntosh, Waverly, Iowa

Filed Jun. 29, 1978, Ser. No. 920,381
Int. Cl.[3] A61M *5/18*
U.S. Cl. 128—217 **15 Claims**



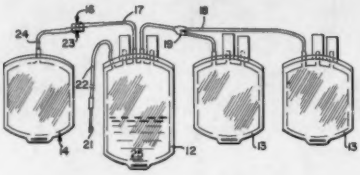
1. An implant gun for depositing items such as pellets, identification means and the like subcutaneously, said implant gun comprising a movable carrier, a hollow needle extending from the forward end of said carrier and movable therewith for creating a cavity in the tissue at the implant site when said needle is inserted into said tissue, means for retaining the item to be implanted in position for implanting through said needle, ram means extending into said carrier and engagable with said item, said ram means and said carrier being relatively movable generally forwardly and rearwardly, and operating means for moving said needle and carrier rearwardly while holding said ram means stationary relative to the implant site so as to withdraw said needle from the implant site while holding the item to be implanted in the cavity created at the implant site as said needle is withdrawn.

4,223,675

SOLUTION CONTAINERS SUCH AS BLOOD BAGS AND SYSTEM FOR PREPARING SAME

Ronald A. Williams, Mundelein, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Jul. 24, 1978, Ser. No. 927,342
Int. Cl.³ A61J 1/00
U.S. Cl. 128—272 **10 Claims**



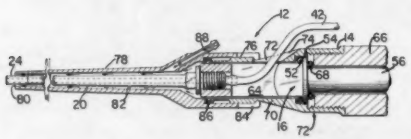
1. A system for producing sterile, non-autoclavable body fluid containers having autoclaved liquid therewithin, comprising a dry-sterilized package formed of a dry-sterilized synthetic resin material, said material being unsuitable for being subjected to autoclave conditions, said material being especially suitable for prolonged storage of body fluids, said dry-sterilized package including a sterile communication with the interior of said package; an autoclavable dispenser constructed of an autoclavable substance, said autoclavable dispenser substance being an autoclaved heat-resistant glass or an autoclaved high melting point resin suitable for sterilizing a liquid within the dispenser, said liquid having been sterilized within the dispenser, said dispenser including a sterile connector having and initially closed sterile aperture in sterile communication with the interior of said dispenser; said package sterile connector and said dispenser sterile connector being in mating engagement with each other to open said initially closed sterile apertures to each other while maintaining both said sterile communication with said interior of the package and said sterile communication with the interior of the dispenser for communicating said dry-sterilized package and said autoclavable dispenser in a sterile and secure manner.

4,223,676

ULTRASONIC ASPIRATOR

David G. Wuchinich; Alan Broadwin, and Robert P. Andersen, all of New York, N.Y., assignors to Cavitron Corporation, New York, N.Y.

Continuation of Ser. No. 672,814, Apr. 1, 1976, Pat. No. 4,063,557. This application Dec. 19, 1977, Ser. No. 861,599
Int. Cl.² A61M 1/00
U.S. Cl. 128—276 **9 Claims**



1. A surgical ultrasonic resonant vibrator dimensioned for mounting in a handpiece, the resonant vibrator providing a vibratory stroke at an ultrasonic frequency at one end thereof for effectively fragmenting various contacted tissues, for example at least 5 mils at about 25 kHz, the resonant vibrator comprising:

an ultrasonic vibration transducer for providing the ultrasonic vibration from electrical excitation in the handpiece;

a tool extending along the longitudinal axis of the resonant vibrator to an end thereof which vibrates with the stroke for effectively fragmenting various contacted tissues; and

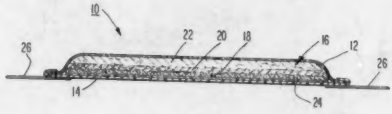
connecting means for connecting and vibrating the tool with the transducer, the connecting means having mounting means for mounting the resonant vibrator in the handpiece and a node of the resonant vibrations intermediate its ends, and an elongated slot extending at least halfway into the connecting means from the exterior of one side thereof and on the side of the mounting means remote from the transducer, the slot having a length along the longitudinal axis of the resonant vibrator sufficient to provide an aspiration path out of the slot from the longitudinal axis at the end of the slot remote from the transducer with a radius of curvature sufficiently large to reduce clogging of the aspiration path with fragmented tissue and coagulated blood, the tool and connecting means further comprising aspiration conduit means extending along the longitudinal axis from the tissue-contacting end of the tool to the slot for aspirating fragmented tissue and blood along the aspiration conduit means and path.

4,223,677

ABSORBENT FIBROUS STRUCTURE AND DISPOSABLE DIAPER INCLUDING SAME

James E. Anderson, Moorestown, N.J., assignor to Scott Paper Company, Philadelphia, Pa.

Continuation of Ser. No. 753,675, Dec. 23, 1976, abandoned. This application May 11, 1979, Ser. No. 38,341
Int. Cl.³ A61F 13/16
U.S. Cl. 128—287 **10 Claims**



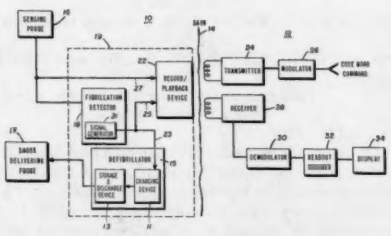
1. An absorbent, dry-formed structure including one type of cellulosic fibers having a varying length no greater than about 6.35 mm., said cellulosic fibers being disposed in at least three different classified layers and having a different weighted average fiber length in each of said layers; said layers being superimposed upon each other in said absorbent structure so that the weighted average fiber length of said cellulosic fibers decreases from layer to layer in a direction from one outer surface to the opposed outer surface.

4,223,678

ARRHYTHMIA RECORDER FOR USE WITH AN IMPLANTABLE DEFIBRILLATOR

Alois A. Langer, Pittsburgh, Pa., and Morton M. Mower, Lutherville, Md., assignors to Mieczyslaw Mirowski, Owings Mills, Md.

Filed May 3, 1978, Ser. No. 902,763
Int. Cl.² A61N 1/32
U.S. Cl. 128—419 D **46 Claims**



1. Apparatus dedicated to a single patient for monitoring the

operation of an automatic defibrillator implanted in the patient, the apparatus comprising:

first detector means responsive to deliverance of defibrillating energy by said implanted defibrillator for triggering the storage of data related to said deliverance of the defibrillating energy;

storage means for durably storing said data;

external receiving means for receiving said data; and

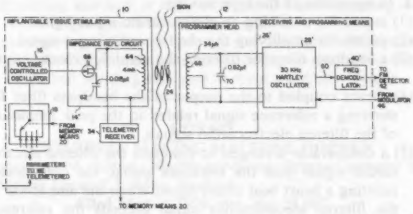
telemetry means for transmitting said data from the patient to said external receiving means.

4,223,679

TELEMETRY MEANS FOR TISSUE STIMULATOR SYSTEM

Joseph H. Schulman, Los Angeles; Brian M. Mann, Northridge, and Russell R. Beane, Sepulveda, all of Calif., assignors to Pacesetter Systems, Inc., Sylmar, Calif.

Filed Feb. 28, 1979, Ser. No. 16,272
Int. Cl.³ A61N *1/36*
U.S. Cl. 128—419 PT **32 Claims**



1. In a living tissue stimulator system comprising an implantable tissue stimulator and an external receiving means, a telemetry means comprising:

a first oscillator means;

a first LC circuit coupled to said first oscillator means;

an impedance reflecting circuit in magnetically coupled relationship to said first LC circuit whereby the combined impedance of said first LC circuit and said impedance reflecting circuit combination is related to the impedance of said impedance reflecting circuit;

altering means for varying the impedance of said impedance reflecting circuit;

a second oscillator means having an output frequency related to a signal voltage to be telemetered; and

means for controlling said altering means by said second oscillator means whereby characteristics of an output signal from said first oscillator means are related to the impedance of said impedance reflecting circuit.

4,223,680

METHOD AND APPARATUS FOR MONITORING METABOLISM IN BODY ORGANS IN VIVO

Frans F. Jöbsis, Durham, N.C., assignor to Duke University, Inc., Durham, N.C.

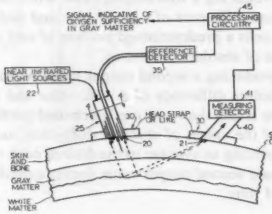
Continuation-in-part of Ser. No. 810,777, Jun. 28, 1977. This application Mar. 5, 1979, Ser. No. 17,727
Int. Cl.² A61B *5/00*
U.S. Cl. 128—633 **30 Claims**

1. A spectrophotometric reflectance method for measuring local metabolism of a body organ such as the brain, in situ, in vivo, non-invasively, atraumatically, harmlessly, rapidly and continuously, said method comprising the steps:

(a) locating and fixing the body in a position appropriate to the measuring operation;

(b) selecting an optical transmission-reflectance path including said organ and extending for several centimeters between points of light entry and exit said points of light entry and exit being laterally spaced several centimeters apart and positioned on contiguous skin surface areas of the body;

(c) establishing a plurality of near-infrared light sources located external of the body and having light emissions of different wavelengths in the 700 to 1300 nanometer spectral range and of an intensity below the level damaging to the body and said organ but sufficient to be detectable by a light sensor after transmission through any skin, bone and tissue included in said path and scattering in and reflectance from said organ along said path, said emissions including at least one measuring wavelength and at least one reference wavelength within said spectral range, each said measuring wavelength being selected such that said organ exhibits a selective absorption therefor, the extent of which is dependent upon a specific state of metabolic activity of said organ;



(d) directing said light emissions at said measuring and reference wavelengths sequentially at said point of entry to be transmitted, reflected and scattered along said path and to said organ and receiving the light emissions reflected directly back from said skin, bone and tissue at or within a few millimeters of said point of entry as well as the light emissions reflected and scattered from said organ at a point several centimeters away from said point of entry and light sensor and circuit means adapted to produce and electrical output signal corrected for changes in blood volume of said skin, bone and tissue during the measuring cycle and representing the difference in absorption of said measuring and reference wavelengths by the organ as a function of the state of said metabolic activity; and

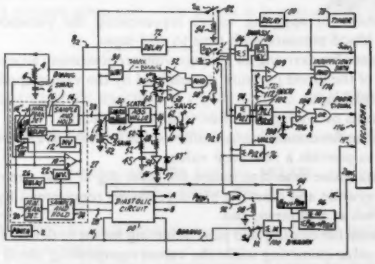
(e) converting said electrical output signal to a signal providing a substantially continuous and rapid measure of said activity.

4,223,681

VALIDATION OF BLOOD PRESSURE

Allan P. Sherman, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 10, 1978, Ser. No. 894,873
Int. Cl.² A61B *5/02*
U.S. Cl. 128—672 **19 Claims**



19. Apparatus for deriving from a signal that represents the

variation of blood pressure with time values representing one of the systolic and diastolic blood pressures that are relatively free from the effects of noise, comprising

means for deriving from a blood pressure signal desired peak values representing one of the systolic and diastolic blood pressure values for each heartbeat, which desired peak values may include undesired peaks of noise having amplitudes that may extend outside of the expected amplitude range of the desired peak value,

means for deriving from the output of said means a reference value representing a long-term average of the desired and undesired peak values,

means for deriving the value of the absolute difference between each peak value and said reference value,

means for deriving an average of the values of absolute difference,

means for producing a first output value when the value of the absolute difference of a peak value and said reference value exceeds a predetermined portion of said average of the values of absolute difference,

means for producing a second output value when the value of the absolute difference of a peak value and said reference value is less than said predetermined portion of said average of the values of absolute difference, and

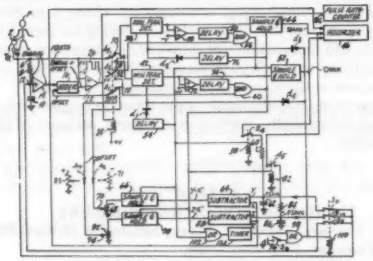
means for deriving an average of the desired peak values that produce said second output value during a predetermined interval of time.

4,223,682

BEAT-TO-BEAT SYSTOLIC AND DIASTOLIC INDICATOR

Allan P. Sherman, Lexington, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 10, 1978, Ser. No. 895,193
Int. Cl.³ A61B 5/02
U.S. Cl. 128—672 **14 Claims**



11. Apparatus for deriving a value representing at least one of the systolic and diastolic blood pressure values for a single heartbeat, comprising

an input,

means for applying values representing the variations of blood pressure with time to said input,

means for deriving an average value representing an average of the blood pressure represented by the values applied to said input,

means providing an offset value,

means for combining said offset value with the average value to provide a reference value,

peak value detecting means for detecting at least one of the systolic and diastolic blood pressures represented by values at said input, and

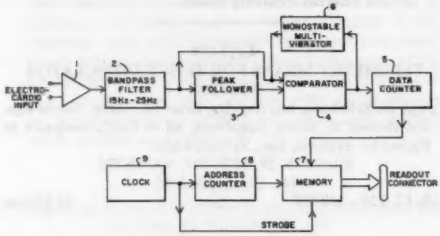
means for causing said peak detecting means to detect a peak value occurring while the values representing blood pressures at said input extend in the same direction with respect to said reference value as said average value.

4,223,683

HEART BEAT CUMULATOR

Bernard Lown, 194 Hobart Rd., Newton, Mass. 02159, and Nicholas Jordan, Boston, Mass., assignors to Bernard Lown, Newton, Mass.

Filed Oct. 30, 1978, Ser. No. 955,792
Int. Cl.³ A61B 5/04
U.S. Cl. 128—706 **3 Claims**



1. In apparatus of the type having

(1) means for obtaining an electrocardio input signal,

(2) means for amplifying the electrocardio input signal,

(3) a bandpass filter for filtering the amplified electrocardio signal,

(4) means coupled to the output of the bandpass filter for deriving a reference signal related to the peak amplitude of the filtered electrocardio signals,

(5) a comparator arranged to compare the filtered electrocardio signal with the reference signal, the comparator emitting a heart beat count signal when the amplitude of the filtered electrocardio signal exceeds the reference signal,

(6) means for preventing actuation of the comparator for a period of time after emission of a heart beat count signal whereby activation of the counter by spurious signals is prevented, and

(7) a heart beat signal counter coupled to the output of the comparator, the heart beat signal counter being arranged to count heart beat signals emitted by the comparator,

the improvement of apparatus for separately recording for each interval the number of heart beats occurring in each of a succession of intervals, the improvement comprising

(a) a memory device having a plurality of recording addresses, the heart beat signal counter being coupled to the memory device for transmission of its count thereto,

(b) a clock arranged to periodically emit clock signals, and

(c) an address counter for controlling the address at which information from the heart beat signal counter is recorded in the memory device, the address counter responding to clock signals by causing information from the heart beat signal counter to be recorded at a new address at periodic intervals.

4,223,684

METHOD AND DEVICE FOR CUTTING A TOBACCO LEAF INTO PORTIONS SUITABLE FOR USE AS BINDERS OR WRAPPERS

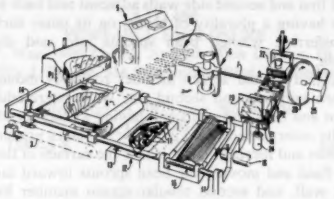
Wilhelmus P. L. Boogers, Eindhoven, and Albertus C. H. Van Liempd, St. Oedenrode, both of Netherlands, assignors to B.V. Arenco P.M.B., Best, Netherlands

Filed Oct. 17, 1978, Ser. No. 952,319
Claims priority, application Netherlands, Nov. 15, 1977, 7712589
Int. Cl.³ A24B 7/00
U.S. Cl. 131—105 **8 Claims**

1. The method of cutting a succession of tobacco leafs, each into portions of predetermined shape, which comprises the steps of:

(a) inspecting a succession of leafs to determine the locations of undesirable portions thereof;

(b) repeatedly transferring a plurality of cutting dies back and forth between one station at which they are arranged in a fixed array and a cutting station at which they are arranged in a succession of unique arrays different from said fixed array and in which each unique array is determined by the inspection of step (a) to allow said cutting dies and a leaf to be reigstered so as to avoid said undesirable portions determined in step (a) for that leaf;



(c) transferring said leafs successively to said cutting station and into registry with the corresponding unique array of cutting dies;

(d) cutting said leafs at said cutting station and capturing the cut leaf portions with said dies; and

(e) removing said cut leaf portion from said dies and depositing them in predetermined relationship to each other on a web, and winding said web to form a bobbin.

4,223,685

CIGARETTE MAKING MACHINE HOPPER

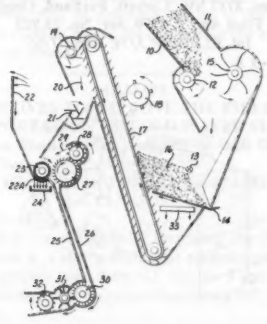
Francis A. M. Labbe, Neuilly-sur-Seine, France, assignor to Molins Limited, London, England

Filed Mar. 7, 1979, Ser. No. 18,007

Claims priority, application United Kingdom, Mar. 18, 1978, 10800/78

Int. Cl.³ A24C *1/02*

U.S. Cl. 131—109 R **9 Claims**



1. A hopper for a cigarette making machine including a tobacco feeding device which delivers tobacco into a downwardly extending channel in which a column of tobacco is formed, and means for feeding tobacco continuously from the lower end of the channel, characterized in that the tobacco feeding device includes means for feeding a stream of tobacco onto a first conveyor which carries the stream of tobacco to a position at which it drops off the conveyor and enters the upper end of the channel, said first conveyor, channel and means for feeding tobacco from the lower end of the channel being arranged along a main path, a spiked conveyor which is spaced slightly from the first conveyor and is arranged to selectively pick up any lumps of tobacco of significant size from the stream of tobacco on the first conveyor, and means for opening up the lumps of tobacco and for returning the opened up tobacco into the main path of the tobacco, said spiked conveyor and means for opening up the lumps of tobacco and for returning the opened up tobacco being along a second path.

4,223,686

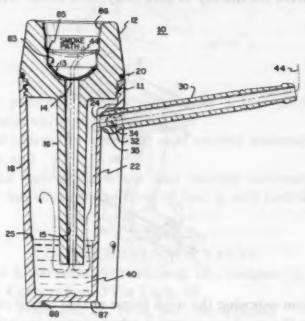
SMOKING APPARATUS WITH CAPILLARY TUBE PRESSURE BALANCE

Joseph E. Murray, Jr., 27 Alpine St., #14, Malden, Mass. 02148

Filed Apr. 26, 1979, Ser. No. 33,396

Int. Cl.³ A24F *1/30*

U.S. Cl. 131—173 **17 Claims**



1. A smoking apparatus comprising:

A. a pipe bowl including a means for supporting smoking material and a base portion with smoke port having a smoke tube extending therefrom,

B. a pipe body having sidewalls extending from a bottom member, and means for coupling said sidewalls to said base portion to enclose a region interior to said sidewalls establishing a reservoir whereby said smoke tube extends into said reservoir, said body being adapted to house a predetermined volume of liquid in said reservoir such that the upper surface of said liquid is above the end of said smoke tube when said apparatus is substantially upright,

C. a reservoir port means for establishing a port in said reservoir at a point above the upper surface of said liquid when said apparatus is substantially upright,

D. a tubular pipe stem and associated valve means, said associated valve means being selectively adapted in a first position to establish a smoke path connecting the region exterior to said pipe by way of said stem interior and said reservoir port to said reservoir, and adapted in a second position to seal off said smoke path,

wherein the size, shape, and surface characteristics of the interior of said smoke tube are related to the physical characteristics and volume of said liquid, the volume of said reservoir, and the pressure exterior to saidapparatus, such that forces on a volume of liquid interior to said smoke tube due to surface tensions of the liquid within the smoke tube and the pressure differential across said volume balance the gravitational force on said volume when said valve means is in said second position.

4,223,687

COMBINATION SMOKING DEVICE AND A LIGHTER FOR SMOKING MATERIAL

Michael W. Sandeen, 2120 Longview Dr., San Leandro, Calif. 94577

Filed Oct. 16, 1978, Ser. No. 952,778

Int. Cl.³ A24F *3/00*

U.S. Cl. 131—180 **3 Claims**

1. A combined smoking device and lighter for the smoking material comprising:

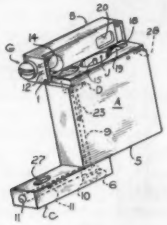
(a) a main body having a combustion chamber for holding the smoking material and opening out at the top of said

body, said body also having a burnable fluid saturated wick disposed adjacent to the top of said chamber;

(b) a mouth piece swingably mounted on said body and movable from closed to open position and having a passage in communication with said chamber;

(c) means for igniting the wick whereby a drawing of air through said mouthpiece passage will create a downdraft at the top of the combustion chamber for causing the wick flame to bend and contact the smoking material to ignite it;

(d) a cover for the top of said body, said cover when in open



position exposing the wick flame so that it will contact and ignite the smoking material when suction is applied at the mouthpiece passage, said cover being swingable into closed position on the body to enclose the top of the combustion chamber and to cover the wick, said cover having air passages therein which are brought into communication with the combustion chamber when the cover is closed; and

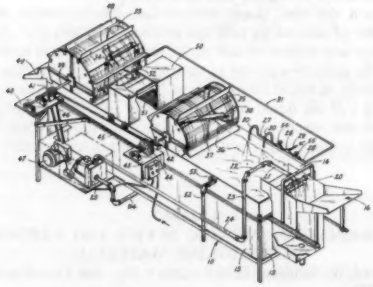
(e) whereby the operator can continue to burn the smoking material in the combustion chamber by intermittently drawing in air and smoke through the mouthpiece passage.

4,223,688

BEAN SPROUT HARVESTER

Kenneth G. Nylund, Rte. 1, Box 40C, Globe, Ariz. 85501, and Kai Y. Lee, Phoenix, Ariz., assignors to Kenneth G. Nylund, Globe, Ariz.

Filed Apr. 25, 1979, Ser. No. 33,133
Int. Cl.³ B08B *3/02, 3/06*
U.S. Cl. 134—60 **9 Claims**



1. A bean sprout harvester for washing bean sprouts and for separating hulls and unsprouted seeds from the bean sprouts, said bean sprout harvester comprising in combination:

a. an open-top tank including first and second side walls, front and back end walls, and a bottom wall for containing a cleaning fluid;

b. a feed chute mounted adjacent said front end wall for receiving the bean sprouts to be washed;

c. a discharge chute mounted adjacent said back end wall for discharging the washed bean sprouts;

d. a plurality of jet nozzles positioned adjacent said feed chute for directing cleaning fluid under pressure at the bean sprouts received by said feed chute;

e. a first tubular screen member rotatably mounted between said first and second side walls adjacent said back end wall and having a plurality of blades on its outer surface for transferring washed bean sprouts into said discharge chute;

f. a second tubular screen member rotatably mounted between said first and second side walls intermediate said front and back end walls and having a plurality of blades on its outer surface, said plurality of blades pressing bean sprouts and foreign matter below the surface of the cleaning fluid and moving the bean sprouts toward said back end wall, said second tubular screen member having a mesh which allows foreign matter to pass through said second tubular screen member and into the interior thereof, said second tubular screen member including conveying means attached to its interior surface for conveying foreign matter within the interior of said second tubular screen member;

g. disposal means positioned within the interior of said second tubular screen member above the surface of the cleaning fluid for receiving the foreign matter conveyed by said conveying means and for removing the received foreign matter to a disposal site; and

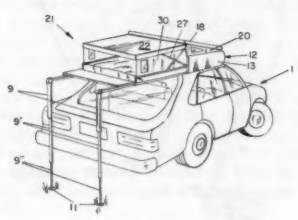
h. drive means coupled to said first and second tubular screen members for rotating said first and second tubular screen members in a direction for moving the bean sprouts toward said back end wall and into said discharge chute.

4,223,689

PORTABLE COLLAPSIBLE VEHICLE ROOF MOUNTED SLEEPING COMPARTMENT

Charlie O. Cox, 3717 SW. Corbett, Portland, Oreg. 97201

Filed Apr. 2, 1979, Ser. No. 25,925
Int. Cl.² B60P *3/34;* **A45F** *1/00*
U.S. Cl. 135—1 A **8 Claims**



1. A portable collapsible sleeping compartment for mounting on the roof of a passenger type vehicle having rack means thereon, parallely spaced longitudinally telescopically extensible rail members removably attached to said rack means, telescopically extensible leg members removably pivoted to said rail members and downwardly dependable therefrom for supporting ground engagement, a main housing compartment comprising rigid front and side walls, open bottom and rear ends, and a flat cover hinged to said front wall, said compartment being mounted on and supported by said rails, a drawer-like section slidably extensible into and from said main compartment and including parallel spaced flat top and bottom walls movably interconnected at their sides by lazy tong type means having intersectingly pivoted arms pivoted at their opposing ends to said top and bottom walls, rear wall means pivoted to the rear of said bottom wall, flexible side curtains extending between said hinged cover and the side walls of said

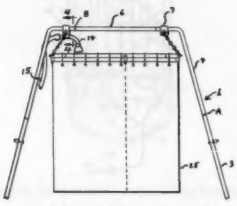
main housing and between the side edges of said top and bottom walls, and a rear curtain at the rear of said drawer-like section, whereby when said latter section is extended from said main housing and the top walls expanded vertically said hinged cover will be angularly elevated to provide a covered and protected sleeping compartment, with said drawer-like section thereof being supported by said rail members.

4,223,690

PORTABLE ENCLOSURE

Glenn P. Wera, 900 Locust, Apt. 2J, West Dundee, Ill. 60118, and Billy J. Dutton, 514 Streamwood Blvd., Streamwood,, Ill. 60103

Filed May 25, 1979, Ser. No. 42,726
Int. Cl.[3] E04H *1/12*
U.S. Cl. 135—5 B **10 Claims**



1. A portable enclosure comprising: four main support members; two lateral support members; joint means for connecting the upper ends of two main support members to each corresponding lateral support member; a multiplicity of limiter blocks; means for connecting the limiter blocks to the lateral support members; a multiplicity of adjustable length members; a curtain support frame; means for connecting a portion of each corresponding adjustable length member to a limiter block and connecting an opposing portion to the curtain support frame; a curtain; means for connecting the curtain to the curtain support frame.

4,223,691

ADDITIVES TO IMPROVE THE PIPELINE TRANSPORTATION OF COLD WATER SLURRIES

Paul E. Titus, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Dec. 26, 1978, Ser. No. 972,841
Int. Cl.[3] F17D *1/16*
U.S. Cl. 137—13 **7 Claims**

1. A method for substantially increasing the density of an aqueous liquid in a slurry with coal particles predominantly varying in particle size from 0.1 mm to 5 mm comprising forming a solution of the aqueous liquid and 20% to 60% w of a saccharide.

4,223,692

RECREATIONAL VEHICLE SAFETY SYSTEM

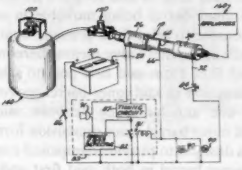
Landis H. Perry, 1028 Monada Pl., Altadena, Calif. 91001

Filed Oct. 19, 1977, Ser. No. 843,455
Int. Cl.[2] F16K *17/30, 31/06;* F17D *5/02;* G08B *17/10*
U.S. Cl. 137—78.4 **27 Claims**

1. In a recreational vehicle having a cabin, at least one appliance, a high-pressure fuel tank to supply fuel to said appliance, a fuel line interconnecting the fuel tank with said appliance and a high-pressure regulator located in the fuel line between the fuel tank and said appliance the improvement including a safety system comprising;

a first automatic valve means coupled directly to said high-pressure fuel tank for shutting off the flow of fuel from said high-pressure fuel tank when a predetermined drop in fuel pressure occurs downstream from said first automatic valve means;

a second automatic valve means coupled to said fuel line downstream from said high-pressure regulator for shutting off the flow of fuel in said fuel line when a predeter-



mined pressure differential occurs across said second automatic valve member;

electrical means for resetting said second automatic valve means, and

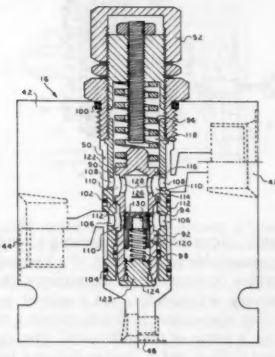
means for indicating when said second automatic valve means has shut off the flow of fuel in said fuel line.

4,223,693

COUNTERBALANCE VALVE

Constantine Kosarzecki, Schaumburg, Ill., assignor to Modular Controls Corporation, Villa Park, Ill.

Filed Jul. 27, 1978, Ser. No. 928,545
Int. Cl.[3] F15B *13/042;* G05D *7/00*
U.S. Cl. 137—106 **10 Claims**



1. A counterbalance valve assembly for directing hydraulic fluid flow in a forward direction to raise a load, and for directing hydraulic fluid flow in a reverse direction to lower the load, said counterbalance valve assembly providing gradually controlled reverse fluid flow to provide gradual and continuous lowering of the load, said counterbalance valve assembly comprising: a valve body including a first port, a second port adapted to receive pilot fluid pressure, a third port adapted for connection to a fluid source, and a valve bore in fluid communication with said first, second, and third ports; and a counterbalance valve disposed within said valve bore and comprising an outer barrel including a first chamber portion having a predetermined inner diameter dimension and a second chamber portion, an inner barrel disposed within said second chamber portion, said inner barrel being arranged for moving in a first and second linear direction and including a circumferential flange formed on said inner barrel separating said first and second chambers, said flange being of lesser dimension than said first chamber inner dimension forming an annular space therebetween, said annular space being the sole communication between said first and second chambers, said inner barrel also including a piston surface in fluid communication with said second port, and valve means disposed within said inner

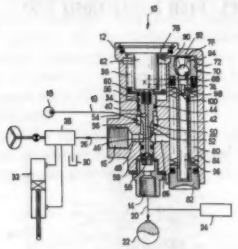
barrel and arranged to move in said first and second linear directions, said valve means being movable in said second linear direction responsive to fluid flow into said third port for providing fluid communication between said first and third ports to direct fluid flow in said forward direction for raising the load, said inner barrel being movable in said first linear direction responsive to pilot fluid pressure against said piston surface and including relief valve means thereon for providing controlled fluid flow from said first port to said third port in said reverse direction as said inner barrel moves for lowering the load and said annular space between said inner barrel flange and said outer barrel inner dimension forming with said first chamber a dashpot to provide dampened controlled movement of said inner barrel in both said first and second linear directions to provide gradual reverse fluid flow and continuous uninterrupted lowering of the load.

4,223,694

HYDRAULIC CIRCUIT BREAKER

Gilbert Kervagoret, Argenteuil, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Jun. 16, 1978, Ser. No. 916,382
Claims priority, application France, Jun. 21, 1977, 77 18951
Int. Cl.[2] G05D *16/10*
U.S. Cl. 137—118 **12 Claims**



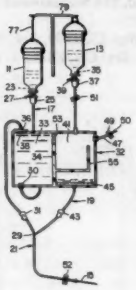
8. A hydraulic circuit breaker comprising a housing with an inlet orifice connectable to the outlet of a hydraulic pump, a first outlet orifice connectable to the pressure chamber of a hydraulic pressure accumulator, and a second outlet orifice connectable to an open-centre hydraulic circuit, a stepped bore in said housing, a piston of the differential type, comprising a larger diameter portion and a smaller diameter portion separated by an annular shoulder, slidable in a fluid-tight manner in said bore and defining therewith an inlet chamber adjacent said annular shoulder and communicating with the inlet orifice and a control chamber adjacent said larger diameter portion, the pressures prevailing in said inlet chamber, said control chamber and said first outlet orifice acting respectively on said annular shoulder, said larger diameter portion and said smaller diameter portion, a constriction orifice being provided said inlet chamber and said second outlet orifice, said constriction orifice having a cross-section which is variable according to the position of said differential piston with respect to said stepped bore, said inlet chamber being connected to said control chamber through a passage comprising a first restriction and being also connected to the first outlet orifice by a connection comprising a non-return valve, said circuit breaker further comprising a resilient vessel having a variable volume compartment connected to said control chamber, said vessel comprising a valve means adapted to connect said compartment to a leakage passage comprising a second restriction when the pressure in said compartment reaches a first predetermined value and to interrupt said connection to said leakage passage when the pressure in said compartment drops below a second predetermined value.

4,223,695

NOVEL VALVE EMPLOYING HYDROPHOBIC AND HYDROPHILIC MEMBRANES

Andrew J. Muetterties, Gages Lake, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 28, 1979, Ser. No. 16,228
Int. Cl.[2] F16T *1/04*; A61M *5/00*
U.S. Cl. 137—173 **6 Claims**



1. A combined air barrier and liquid sequencing valve providing separate flow paths therethrough for a first and second liquid, preventing the passage of air from said separate flow paths and effecting the automatic interruption of the flow of said first liquid whenever said second liquid is flowing therethrough under a greater pressure than that of said first liquid and the automatic resumption of the flow of said first liquid whenever the flow of said second liquid through said valve ceases, said valve comprising:

a housing divided into first and second chambers by a vertical wall having an aperture therethrough, said aperture covered by a hydrophobic membrane, whereby air can pass between said first and second chamber,

said first chamber having an inlet port thereto, and an outlet port at the top thereof covered by a hydrophilic membrane, whereby air is prevented from passing through said outlet,

said second chamber having an inlet port thereto, and an outlet port therefrom covered by a hydrophilic membrane, whereby air is prevented from passing from said outlet, and a reservoir for liquid spaced between said inlet and outlet thereto, said reservoir having an open top located directly under said inlet port to said second chamber,

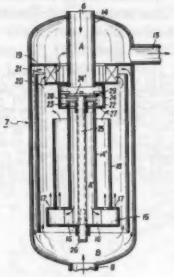
whereby, with said primary liquid flowing through said first chamber, said secondary liquid entering said second chamber through said inlet port thereto fills said reservoir until said secondary liquid overflows from said reservoir and flows through said outlet port thereof and air present in said reservoir prior to its displacement therefrom by said secondary liquid escapes from said second chamber through said hydrdophobic membrane covering said aperture in said vertical wall between said first and second chambers under the pressure of said second liquid, thereby forcing said first liquid away from said outlet to said first chamber and interrupting the flow of said first liquid until the flow of said second liquid through said second chamber ceases and allows said first liquid to force said air through said hydrophobic membrane and resume flowing through said first chamber.

4,223,696

APPARATUS FOR THE PURPOSE OF AVOIDING PRESSURE DROP BETWEEN A GASEOUS OR VAPOROUS PHASE AND A LIQUID PHASE

Gundolf E. Rajakovics, Anzengruberstr. 14, Leoben, (Steiermark), Austria

Filed Mar. 20, 1978, Ser. No. 887,862
Claims priority, application Austria, Mar. 21, 1977, 1942/77
Int. Cl.[2] F17C *1/00*
U.S. Cl. 137—206 10 Claims



1. An apparatus for pressure regulation between a gaseous or vaporous phase and a liquid phase, the said apparatus comprising

(a) a first chamber in which there is present a gaseous or vaporous medium under pressure;

(b) a second chamber filled predominantly with a liquid medium which is at a pressure independent from the pressure in said first chamber;

(c) an intermediate chamber filled in normal operation with substantially the same gaseous or vaporous medium at substantially the same pressure as present in said first chamber;

(d) duct means for connecting the said first chamber through said intermediate chamber with said second chamber;

(e) means for causing a predetermined pressure drop between said intermediate chamber and said second chamber, and

(f) a piston operated shut-off device adapted to assume an open and a closed position, the said shut-off device being disposed between said first and said second chamber, the pressure of the second chamber acting on the one end of said piston by means of said liquid medium so as to cause the shut-off device to move into the open position and the pressure in said first chamber acting on the other end of said piston so as to cause the shut-off device to move into the closed position, the differential between said two pressures during normal operation causing the shut-off device to remain in the open position and the said pressure differential causing the shut-off device to move into the closed position when the said pressure drop is exceeded by a predetermined value so as to prevent a sudden overrun from the first into the second chamber in case of said excess pressure drop in the second chamber.

4,223,697

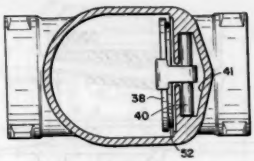
CHECK VALVE

Jack G. Pendleton, Coffeyville, Kans., assignor to Judd Valve Company, Inc., Tulsa, Okla.

Filed Jul. 31, 1978, Ser. No. 929,648
Int. Cl.[3] F16K *15/03*
U.S. Cl. 137—527.8 4 Claims

1. In a check valve having a valve seat and a cooperating pivotally mounted clapper member, said clapper member having a closed surface area for contacting said valve seat, an improvement comprising:

a substantially V-shaped recess provided in the clapper member closed surface area and an O-ring disposed in said



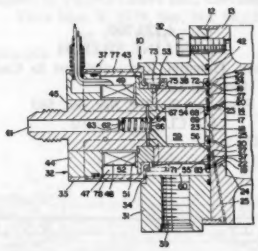
V-shaped recess the cross-sectional angle of said V-shaped recess being acute.

4,223,698

SOLENOID OPERATED BIPROPELLANT VALVE

Robert H. Reinicke, Mission Viejo, Calif., assignor to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Mar. 9, 1978, Ser. No. 884,875
Int. Cl.[2] F16K *11/14*
U.S. Cl. 137—595 24 Claims



1. A solenoid operated valve comprising a housing having a first passage and a second passage, a first movable valve element in the housing controlling flow of fluid through the first passage, a second movable valve element in the housing controlling flow of fluid through the second passage, said second valve element being annular and surrounding said first valve element, and a single solenoid controlling movement of both valve elements.

4,223,699

FLUID DISPENSING NOZZLE

Paul R. Wilder, and Chester W. Wood, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 813,809, Jul. 8, 1977, abandoned, which is a division of Ser. No. 586,192, Jun. 12, 1975, Pat. No. 4,036,259, which is a continuation of Ser. No. 439,302, Feb. 2, 1974, abandoned, which is a division of Ser. No. 244,844, Apr. 17, 1972, Pat. No. 3,817,285. This application Nov. 24, 1978, Ser. No. 963,435
Int. Cl.[3] B67D *5/37*
U.S. Cl. 137—801 2 Claims

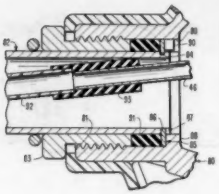
2. A fluid dispensing nozzle, comprising:

(a) a body having inlet and outlet openings with a flow passage therebetween;

(b) a valve in the body movable between open and closed positions to selectively establish fluid communication between the inlet and outlet openings;

(c) a retainer fitted to the body proximal to the outlet opening and adapted to receive a discharge spout;

(d) a discharge spout releasably secured to the retainer for discharging fluid flowing through the body; and



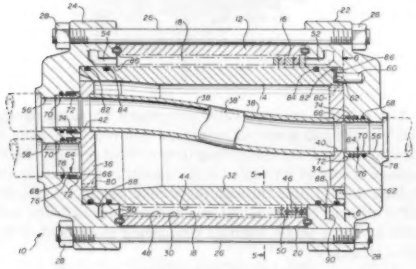
(e) means associated with the discharge spout for positively engaging the body and preventing rotation and maintaining alignment of the spout relative to the body.

4,223,700

FLOW LINE SWITCH

Marvin R. Jones, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Jan. 2, 1979, Ser. No. 583
Int. Cl.[3] F16K *11/02*
U.S. Cl. 137—874 **14 Claims**



1. A flow line switch comprising

a housing having an internal cylindrical chamber,

at least one passage communicating through the housing into one end of the chamber,

at least two passages communicating through the housing into the other end of the chamber,

a rotor positioned within the chamber against the ends thereof and having an exterior cylindrical surface spaced from the interior cylindrical surface of the housing to form an annular space and a tube extending through the rotor to communicate between the ends of the chamber,

an annular piston positioned within said annular space,

means for introducing an actuating fluid into either end of said annular space to cause the piston to reciprocate therein, and

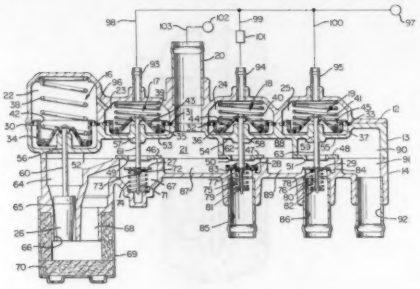
means connecting the piston with the rotor and the piston with the housing so that movement of the piston in one direction rotates the rotor and movement of the piston in the opposite direction reverses the direction of rotation of the rotor whereby the tube provides a change of communication between the housing end passages.

4,223,701

CONTROL UNIT AND METHOD OF MAKING THE SAME

Harley V. Bible, Maryville, and William T. Moon, Jr., Knoxville, both of Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed May 17, 1978, Ser. No. 906,490
Int. Cl.[2] F16K *27/02*
U.S. Cl. 137—882 **18 Claims**



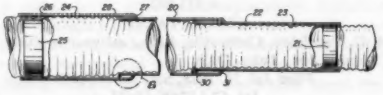
13. In a control means having a plurality of pneumatically operated valve constructions for controlling the fluid flow from a first fluid source in relation to the condition of a second fluid source that is adapted to be interconnected to said pneumatically operated valve constructions, each valve construction having a flexible diaphragm means interconnected to a valve member by an actuator stem, the improvement comprising a self-contained housing structure carrying said valve constructions therein in substantially an annular array and having a centrally arranged inlet chamber substantially concentric to said annular array and being adapted to be interconnected to said first fluid source, said housing structure comprising two outboard housing sections and an intermediate housing section secured together in stacked relation, said diaphragm means being held between said intermediate housing section and one of said outboard housing sections, each said valve member being disposed in the other of said outboard housing sections, said intermediate housing section having said inlet chamber therein and leading to certain of said valve constructions, said other housing section having a plurality of valve seats respectively controlled by said valve members and having a plurality of outlet chambers respectively associated with said valve seats, certain of said valve constructions having said actuator stems thereof passing through their respective valve seats whereby said valve seats of said certain of said valve constructions are intermediate said valve members thereof and said diaphragm means thereof.

4,223,702

DRAIN LINE FOR RECREATIONAL VEHICLES

James Cook, P.O. Box 101, Sugarland, Tex. 77478

Filed Dec. 26, 1978, Ser. No. 973,002
Int. Cl.[3] F16K *27/12*; F16L *3/00*
U.S. Cl. 138—106 **9 Claims**



1. A telescoping drain line for recreational vehicles, or the like, comprising in combination:

a telescoping rigid wall drain pipe having a plurality of sections telescoping one within the other;

a flexible hose extending through said telescoping rigid wall

drain pipe for contracting and expanding with the telescoping of said telescoping rigid drain pipe; and

means for attaching said flexible hose to at least two telescoping rigid wall pipe sections between the ends of said flexible hose, whereby said flexible hose will expand or contract inside said telescoping rigid wall drain pipe responsive to the telescoping of said pipe.

4,223,703

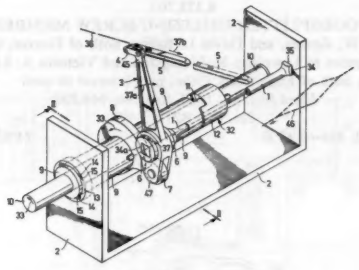
PICKING MECHANISM FOR A SHUTTLE OF A WEAVING MACHINE

Erwin Pfarrwaller, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Aug. 17, 1978, Ser. No. 934,474

Int. Cl.[2] D03D *49/32*

U.S. Cl. 139—145 **15 Claims**



1. A picking mechanism for a shuttle of a weaving machine, said mechanism including

a rocking lever;

a picking element mounted on said lever for picking a shuttle;

a spring connected to said lever to bias said lever in a picking direction;

a rotatable drive shaft;

a tensioning means for stressing said spring in a direction away from said picking direction, said means including at least one freely rotatable cam disc mounted on said shaft, a unilaterally acting clutch having a driving half mounted on said shaft for rotation therewith and a driven half secured to said cam disc, said halves being disposed in facing relation to each other, said cam disc having a series of cam sections in engagement with said rocking lever for accelerating the movement of said lever in said picking direction under the bias of said spring during rotation of said shaft while forming a clearance between said clutch halves and for subsequently partially stressing said spring for a subsequent pick; and

a non-return means for preventing counter-rotation of said cam disc.

4,223,704

METHOD AND APPARATUS FOR ATTACHING A METALLIC CONNECTION ELEMENT AT A SUPPORT, ESPECIALLY FOR CONNECTING THE OVER-LAPPING SECTIONS OF A PACKAGING BAND OR THE LIKE

Heinrich Glaus, Niederwangen, Switzerland, assignor to Strapex AG, Wohlen, Switzerland

Filed Dec. 6, 1978, Ser. No. 966,820

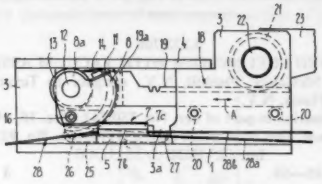
Claims priority, application Switzerland, Dec. 28, 1977, 16118/77

Int. Cl.[3] B21F *9/02*

U.S. Cl. 140—93.4 **18 Claims**

1. A method for interconnecting the overlying sections of a band or strap, preferably a band or strap wound about an artcle, by means of a metallic closure element having closure flaps extending in the lengthwise direction thereof and located at opposite sides of a base portion of said closure element and protruding therefrom, comprising the steps of:

placing the overlying band or strap sections between the closure flaps, and



progressively pressing against the base portion both closure flaps in the lengthwise direction of the closure element from one end of the closure element by rolling said closure flaps against the base portion, in order to thereby fixedly clamp the overlying band or strap sections between the base portion and the closure flaps.

4,223,705

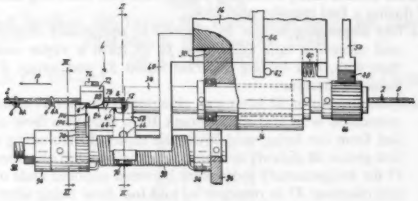
WIRE KNOTTING MACHINE

George E. Bell, Florence, Miss., and John P. Gowing, Joplin, Mo., assignors to Flex-O-Lators Inc., Carthage, Mo.

Filed Mar. 9, 1979, Ser. No. 19,226

Int. Cl.[3] B21F *1/06*

U.S. Cl. 140—104 **9 Claims**



1. A wire knotting machine for securing a first wire to a second wire extending at right angles to the first, said first wire being closely adjacent the second, and having a standing portion extending in one direction from said second wire and a relatively short end portion extending oppositely from said second wire, said machine comprising:

a. a driver member rotatable coaxially with said second wire and having an extension parallel but eccentric to its axis and normally underlying said first wire at the side thereof opposite from said second wire,

b. means operable to turn said driver member with an angularly reciprocal motion, whereby during the motion thereof in one direction, the extension thereof engages the end portion of said first wire and bends it around said second wire toward its own standing portion, and

c. a fixed anvil having an arcuate concavity which has an axis of curvature generally parallel to the first wire, and curved about said first wire standing portion, in spaced apart relation therefrom, at the side thereof opposite to that toward which the end portion thereof is moved by said driver member, said anvil being disposed so as to be engaged by the part of the end portion of said first wire projecting outwardly from its point of engagement by said driver extension, said driver operating to force said projecting wire portion against said anvil concavity, whereby said projecting wire end portion is bent around the standing portion thereof at the side thereof opposite to the direction it was caused by said driver to approach said standing portion, during the final portion of the movement

of said driver, both the bend of the first wire about the second wire, and the bend of its end portion about its standing portion, thereby being accomplished by a single motion of said driver member in one direction, after which said driver member returns to its starting position.

4,223,706

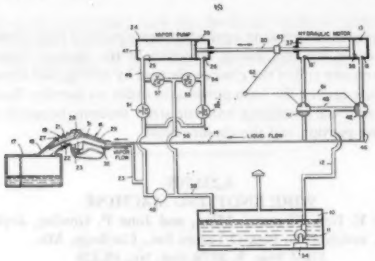
CLOSED FUEL SYSTEM WITH VACUUM ASSIST

Dean C. McGahey, Fishkill, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 750,742, Dec. 15, 1976, abandoned. This application Jun. 8, 1978, Ser. No. 913,976

Int. Cl.[2] **B65B** *3/18, 31/00*

U.S. Cl. 141—59 **3 Claims**



1. In a system for conducting a vaporizable liquid fuel from a storage tank **10**, to a receiving tank **17** having a filler pipe **18**, and for concurrently removing vapor from said receiving tank **17** during a fuel transfer operation,

a fuel dispensing nozzle **16** adapted to removably engage said receiving tank filler pipe **18** to form a vapor seal therewith, and having separate liquid **31** and vapor **32** passages therein,

a hydraulic motor **13** having an elongated chamber **37** communicated with said storage tank **10** to receive a flow of fuel from the latter, said hydraulic motor **13** including a first piston **38** slidably mounted in said elongated chamber **37** for reciprocatory movement between opposed ends of said chamber **37** in response to said fuel flow being alternately introduced into the chamber respective opposed ends,

a vapor pump **24** including a closed elongated chamber **47**, a second piston **39** longitudinally received in said closed elongated chamber **47** for reciprocatory movement therein between respective ends of said elongated chamber **47**,

connecting means **20** operably engaging said respective first **38** and second **39** pistons to permit concurrent reciprocal movement thereof through the motor **13** and pump **24** elongated chambers, respectively,

control valve means including at least two flow directing valves **41** and **42** communicated with said tank **10** and with the respective ends of said hydraulic motor chamber **37**, said flow directing valve means **41** and **42** being operably connected **61**, **62**, **63** to said slidably mounted first piston **38** to be operated by the latter, and to direct sequential liquid flows through the control valve means to the respective ends of elongated chamber **37** in response to the disposition of the slidably mounted piston **38** during reciprocatory movement of the latter, and conduit means **14** communicating said two flow directing valves **41** and **42** to said nozzle **16** liquid passage **31**,

first vapor conduit means **23**, **49**, **54** communicating said nozzle vapor passage **32** with the respective opposed ends of said vapor pump **24** elongated chamber **47**, check valve means **51** and **52** in said first vapor conduit means being operable to allow unidirectional flow of vapor to said elongated chamber **47** from said vapor passage **32**,

vapor return conduit means **56** and **58** communicating the respective elongated chamber **47** ends with said tank **10**, and check valve means **53** and **57** disposed in said vapor return conduit means to permit unidirectional vapor flow to said tank **10**, whereby to direct vapor flow to said tank **10** in response to reciprocatory movement of said piston **38** in said elongated chamber **47**,

a pressure responsive valve **48** communicating said nozzle vapor passage **32** with said tank **10**, said valve **48** being operable to the open position in response to a predetermined pressure within said vapor passage **32** to bypass vapor flow around said first vapor conduit means **23**, **49**, **54** and said vapor return conduit means **56**, **58**, into said tank **10**, and when said pressure responsive valve **48** is in the closed position at a pressure less than said predetermined pressure the vapor flow will be delivered from said vapor passage **32** to said vapor pump **24** elongated chamber **47**.

4,223,707

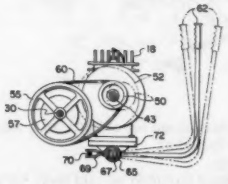
WOODSPLITTER UTILIZING SCREW MEMBER

Bruce W. Jensen, and David L. Bacon, both of Denver, Colo., assignors to Lawrence E. Livingston and Victoria A. Livingston, both of Englewood, Colo., part interest to each

Filed Sep. 22, 1978, Ser. No. 944,835

Int. Cl.[3] **B27L** *7/00*

U.S. Cl. 144—193 R **11 Claims**



1. Apparatus for splitting articles, the apparatus comprising:

an elongated bed structure;

a trolley mounted for movement along the length of the bed structure;

an abutment;

a splitting blade, one of the abutment and the splitting blade being mounted on the trolley and the other being fixedly mounted relative to the bed structure;

a nut member having female threads defined therethrough and being attached to the trolley;

an elongated screw member rotatably mounted and extending in a direction parallel to the length of the elongated bed, the screw member engaging the threads of the nut member;

thrust means for axially locating the screw member, the thrust means being positioned at a portion of the screw member positioned more closely to the fixedly mounted of the splitting blade and abutment than to the other of the splitting blade and abutment mounted on the trolley;

a prime mover; and

drive means operably connecting the prime mover to the screw member, the drive means comprise a drive V-belt pulley and a drive wheel coaxially mounted at the output of the prime mover and axially spaced therealong, a driven V-belt pulley and a driven wheel coaxially mounted at an end of the screw member and axially spaced therealong with the driven V-belt pulley and drive V-belt pulley being mutually radially spaced but axially aligned, and the driven wheel and drive wheel being mutually radially spaced but axially aligned, centrally biased pivotal mounting means for the prime mover mounting the prime mover for rotational movement around an axis substantially parallel to the prime mover output shaft and resiliently biased to a neutral position,

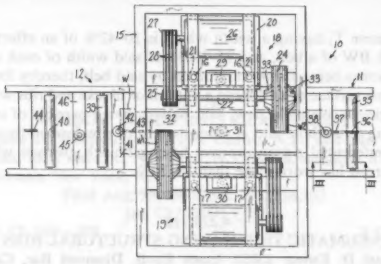
and a V-belt connecting the drive V-pulley and the driven V-belt pulley, whereby the prime mover may be rotated to engage, selectively, the driven wheel and drive wheel, or selectively rotated to tension the V-belt, to thus rotate the screw member in the first rotational direction or the second rotational direction, or positioned in the neutral position at which neither the pulleys nor the wheels are engaged.

4,223,708

DOUBLE MORTISE CUTTER AND METHOD OF USING SAME

Alfonso A. Paris, Jr., and Douglas W. Muscanell, both of South Hill, Va., assignors to New England Log Homes, Inc., Hamden, Conn.

Filed Apr. 13, 1978, Ser. No. 895,923
Int. Cl.³ B27C *9/04*
U.S. Cl. 144—326 R **7 Claims**



1. A mortising machine comprising a frame having upstream and downstream ends, a pair of radially symmetrical vertically movable supports, means on the frame for guiding the supports, each support carrying a dado head mounted on a horizontal axle, a feed table upstream of the frame and having means for guiding a grooved log on a path parallel to the axles of both dado heads, a delivery table downstream of the frame and having means for guiding a grooved log in the same line as the feed table, a first vertically movable log engaging stop located downstream of the paths of both dado heads in the direction of movement of a log from the feed table to the delivery table, a second vertically movable log engaging stop located between the feed table guide means and the paths of both dado heads, independently operable means for moving either stop into and out of log holding position, and independently operable means for moving either dado head support into and out of operative position, the cutting face of each dado head being guided on a path corresponding substantially to a vertical plane through the center line of the log and said dado heads being disposed on opposite sides of said plane.

4,223,709

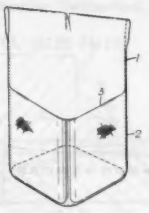
REINFORCED FLEXIBLE CONTAINER

Eirik Myklebust, Porsgrunn, Norway, assignor to Norsk Hydro A/S, Oslo, Norway

Filed May 15, 1979, Ser. No. 39,381
Claims priority, application Norway, Jun. 1, 1978, 781905
Int. Cl.³ B65D *33/02*
U.S. Cl. 150—1 **5 Claims**

1. A reinforced flexible container unit for transportion and storage of bulk material, said unit comprising:

a flexible container including an upper section having lifting loops and a filling opening, a container bottom, and a central section formed by side walls extending from said container bottom to said upper section, said central section having a height portion extending upwardly from said container bottom and adapted to be contacted by bulk material when said container is filled with such bulk material; and reinforcing means for reinforcing said container against rupture caused by strain imparted to said container when filled with bulk material upon dropping of such filled container, said reinforcing means comprising at least one belt formed of a material capable of resisting said strain, said belt being positioned to extend around the entire circumference of said central section of said container at least at a lower portion thereof adjacent said container bottom, said belt having an open lower end, said belt not covering or enclosing said container bottom, and the total width of said belt being from one-third the height of said height portion of said central section of said container to equal to said height of said height portion.

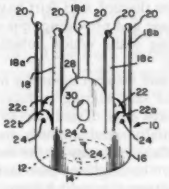


4,223,710

STORING AND DISPENSING MEANS FOR HOSE AND THE LIKE

Jack Brothers, 806 Tuxedo Dr., Fort Walton Beach, Fla. 32548

Filed May 3, 1979, Ser. No. 35,446
Int. Cl.³ B65D *85/675*
U.S. Cl. 150—0.5 **8 Claims**



1. Storing and dispensing means for hose, rope, wire, and like filamentary material, comprising:

an apertured base; and

an annular shell having first and second opposite ends; wherein

said first of said opposite ends is integral with, and disposed normal to, said base;

said second of said opposite ends has means defining a closure, disposed across said second end, which lies substantially parallel with said base; and

said closure-defining means comprises a plurality of mutually-traversing limbs; wherein

said limbs have latching means formed at ends thereof;

said shell has means for engagingly securing said limb-end latching means;

said limb-end latching means are engageably secured by said securing means;

said second end further has a plurality of webs;

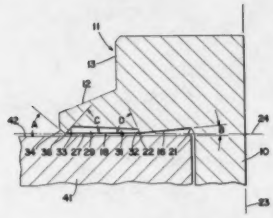
said limb-end latching means comprise tabs formed at the ends of said limbs; and

each of said webs has a tab-receiving opening formed therein which replaceably latches one of said tabs therewithin.

4,223,711
SELF-LOCKING FASTENER

Joseph A. Tabor, Mentor, Ohio, assignor to Russell, Burdsall & Ward Corporation, Mentor, Ohio

Filed Jul. 3, 1978, Ser. No. 921,716
Int. Cl.[2] F16B *39/282*
U.S. Cl. 151—37 7 Claims



1. A self-locking fastener comprising thread means around a central axis, a load surface, and wrenching means permitting said fastener to be tightened and loosened, said load surface being adapted to be tightened against a substantially flat mating surface and providing self-locking means including:

(a) an annular bearing surface concentric with said thread means having an outer edge located in a bearing plane perpendicular to said central axis and extending back from said plane as it extends radially inward from said edge;

(b) a plurality of circumferentially disposed radially extending teeth extending substantially radially from said edge of said bearing surface, said teeth providing edges lying along said plane, inclined ramp surfaces and axially extending locking surfaces which extend to an inner axially extending end surface and cooperate therewith to define recesses between said teeth extending back from said bearing plane along the entire length of said teeth;

(c) an annular axially extending skirt around said teeth at the outer extremities thereof, said skirt having an axial edge in said bearing plane and providing opposed inner and outer axially extending walls which substantially intersect at said axial edge;

(d) tightening of said fastener against a mating surface causing said edge of said bearing surface, said edges of said teeth and said axial edge of said skirt to engage said mating surface substantially simultaneously and to be pressed into said mating surface and causing the material forming said mating surface to be displaced past said bearing plane into said recesses adjacent to said locking surfaces so that a mechanical interference is established between said locking surfaces and the material of said mating surface displaced past said bearing plane to resist loosening of said fastener, said ramp surfaces engaging the material displaced past said bearing plane while said fastener is being tightened and operating to provide a camming action allowing continued tightening of said fastener without encountering excessive torque; and

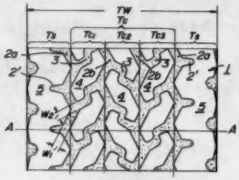
(e) said skirt and said bearing surface providing support for the ends of said teeth and also cooperating to form a continuous seal along both extremities of said teeth.

4,223,712
PNEUMATIC TIRE FOR HEAVY DUTY VEHICLES

Norio Iwata, Kodaira, and Hiroshi Kojima, Hino, both of Japan, assignors to Bridgestone Tire Company, Limited, Tokyo, Japan

Filed Aug. 28, 1978, Ser. No. 937,374
Claims priority, application Japan, Sep. 1, 1977, 52-104160
Int. Cl.[2] B60C *11/08, 11/06*
U.S. Cl. 152—209 D 10 Claims

1. A pneumatic tire for a heavy duty vehicles, comprising a tread divided by two circumferential zigzag grooves in a tread center zone and remaining side zones consisting of circumferentially continuous ribs, said tread center zone including block patterns of elongated blocks circumferentially discontinuous with traverse grooves, said traverse grooves being provided in their substantially mid portions 30–70% of their lengths with platforms rendering said traverse grooves shallower 30–70% than their original depths, widths of said traverse grooves measured perpendicularly to their lengthwise direction being 0.2–0.3 times of the traverse length of said blocks, each said

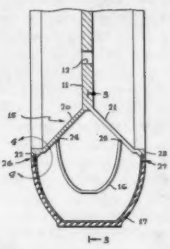


side zone T_s having a width which is 20–42% of an effective width BW of a belt, and 75–100% of said width of each said side zones being firmly reinforced by said belt, thereby forming in a surface of said tread a pattern of blocks and ribs when said tire is relatively new, said pattern being capable of converting as a whole into another pattern of ribs formed by said circumferential zigzag grooves having branch grooves when said tread has worn more than 30–70%.

4,223,713
PNEUMATIC TIRE HAVING STRUCTURAL RIBS

Michael D. Ewing, 23051 Aspen Knoll, Diamond Bar, Calif. 91765

Filed Sep. 5, 1978, Ser. No. 939,483
Int. Cl.[2] B60B *21/10;* B60C *5/16*
U.S. Cl. 152—330 RF 3 Claims



1. A safety tire comprising the combination of:

a wheel hub having a central opening for insertably receiving the end of an axle;

said wheel hub further having a plurality of stud receiving openings arranged in a circular pattern coaxial with respect to said central axle opening;

said wheel hub terminating in a circular rim extending outwardly in a diverging manner from opposite sides of said hub circumferential periphery;

spoke means fixed to said rim and radiating outwardly therefrom;

a flexible tire casing bonded to opposite sides of said rim so as to capture air between the interior of said tire and the opposing surface of said rim;

said spoke means includes a plurality of spokes of substantially U-shaped configuration arranged in fixed spaced apart relationship having the opposite ends thereof integrally secured to said rim;

said rim includes a pair of flange portions having one end secured to said hub and the other end projecting outwardly so as to combine to form said rim;

said tire casing includes sides bonded to the free ends of said flange portions with a substantial space separating said spokes from the internal opposing surface of a tread portion joining said tire sides together;

said wheel hub and said rim and said spoke means are integral and constitute a single unitary construction;

said spokes integrally join with said rim mid-way between its opposite ends of said flange portions;

said flange portions include an annular groove for receiving the ends of said tire sides for bonding said tire onto said flange portions and said tire including a reinforcement belting bonded to the inner surface of said tire.

4,223,714

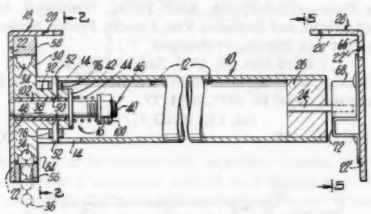
WINDOW SHADE ROLLER ASSEMBLY

Stephen D. Weinreich, Rockville Centre, N.Y., and Joel Berman, 102 Prince St., New York, N.Y. 10012, assignors to Joel Berman, New York, N.Y.

Filed Aug. 20, 1976, Ser. No. 716,153

Int. Cl.[2] E06B *9/20*

U.S. Cl. 160—309 **1 Claim**



1. A shade roll assembly comprising in combination:

a shade roll;

an engagement apparatus formed at a first end of the shade roll for supporting the shade roll;

apparatus for supporting rotatably a second end of the shade roll;

a shade roll actuating and rotating system organized at the first end of the shade roll, said shade roll actuating and rotating system including a mounting plate having a pin extending therefrom axially of the shade roll, a wheel mounted rotatably on the pin and having one vertical face arranged and organized in frictional contact with the mounting plate, the wheel having a hub of a diameter smaller than the shade roll and projecting from an opposite face thereof, a plurality of projections extending radially from the hub in slidable engagement with the engagement mechanism for supporting the first end of the shade roll on the hub, a spring mounted on the pin inward relative to the shade roll and beyond the hub, means mounted on a free end of the pin organized and arranged for urging the spring means against the hub and in turn a face of the wheel against the mounting plate, and a wheel engaging mechanism organized and adapted to rotate the wheel and in turn the shade roll mounted on the hub;

the shade roll assembly characterized in that all of the elements of said shade roll actuating and rotating system are mounted on the engagement apparatus.

4,223,715

SEGMENT EXCHANGER APPARATUS FOR A CONTINUOUS CASTING INSTALLATION AND METHOD OF OPERATING THE SAME

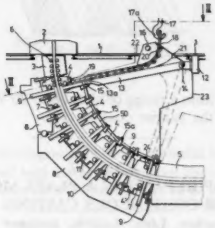
Hans Streubel, Düsseldorf, Fed. Rep. of Germany, assignor to Concast AG, Zürich, Switzerland

Filed Apr. 5, 1979, Ser. No. 27,495

Claims priority, application Switzerland, Apr. 19, 1978, 4187/78

Int. Cl.[3] B22D *11/128*

U.S. Cl. 164—1 **10 Claims**



1. A segment exchanger apparatus for a continuous casting installation comprising:

at least partially curved roller apron means subdivided into segments;

support frame means for mounting the segments, said support frame including stationary guide means for each segment;

an inner track section;

means for mounting said inner track section to be pivotal about a substantially horizontal axis so as to selectively be positionally adjustable with respect to any predetermined one of said stationary guide means;

displaceable arresting means provided to cooperate with said pivotable inner track section for the aligned positioning and supporting of the track section at any of the stationary guide means for each segment dismantling position of the pivotable inner track section;

said segments being provided with dismantling guide elements;

said track section having guide surface means near the track section mounting means which, upon passage of any segment upon said track section, cooperates with the dismantling guide elements of the throughpassing segment for pivoting said segment during its throughpassage.

4,223,716

METHOD OF MAKING AND USING A CERAMIC SHELL MOLD

Richard C. Ostrowski, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 4, 1978, Ser. No. 971,981

Int. Cl.[3] B22C *1/04*

U.S. Cl. 164—26 **13 Claims**

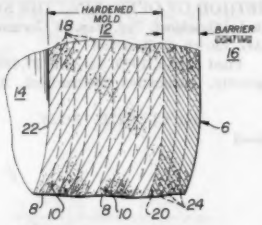
1. A method of making a ceramic shell mold (**6**) comprising:

Step (a) alternately applying a coating composition (**8**) including a ceramic powder and a binder, and then a stucco composition (**10**) including granular refractory material to an expendable pattern a preselected number of times, drying the coating between applications, and forming a resultant multi-layered mold, said multi-layered mold having less than 0.5 Wt.% graphite:

Step (b) heating the multi-layered mold, removing the pattern, and forming a resultant hardened mold (**12**); and

Step (c) applying a barrier coating (**16**) to the exterior surface of the multi-layered mold (**12**) while the hardened mold (**12**) is at a preselected temperature above ambient,

said barrier coating (16) including a mixture of a ceramic power, a binder, and a preselected amount of particulate



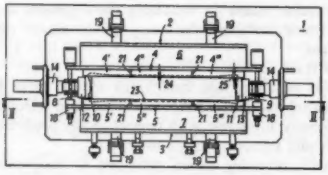
graphite within a range of about 4 to 20 Wt.% of the solid portion of the barrier coating (16).

4,223,717

METHOD OF REPAIRING A PLATE MOULD TO BE USED FOR CONTINUOUS CASTING OF STEEL

Werner Scheurecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 27, 1979, Ser. No. 52,346
Claims priority, application Austria, Jul. 5, 1978, 4858/78
Int. Cl.³ B22D *11/00*
U.S. Cl. 164—76 **2 Claims**



1. In a method of repairing a plate mould to be used for continuous casting of steel, in particular steel slabs, of the type including a supporting frame, mould walls defining a rectangular mould cavity and supportd against said supporting frame, said mould walls including narrow- side walls and broad-side walls, each one of said broad-side walls being assembled of a supporting plate and a cooled inner-wall plate, and said narrow-side walls being inserted between said broad-side walls, said inner- wall plate being designed in three parts so as to form partition joints between said three parts extending approximately in the longitudinal direction of said plate mould, the improvement which is characterized in that, after occurrence of wear at said inner-wall plates, each one of said three parts thereof is worked off by a measure corresponding to the greatest extent of wear having occurred on the respective part, so as to become plane, and the innermost part thereof is complemented by equally thick outermost replacement parts so as to form a new inner-wall plate.

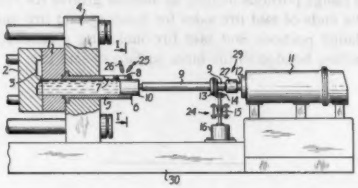
4,223,718

MOLTEN METAL INJECTION DEVICE FOR DIE CASTING MACHINE

Isao Miki, 1288-1 Kusanagi, Shimizu-shi, Shizuoka-ken; Takeshi Kido, 977 Tadehara, Fuji-shi, Shizuoka-ken, and Keiichi Kokubun, 2-1-2 Fujigaoka, Yokohama-shi, Kanagawa-ken, all of Japan

Continuation of Ser. No. 613,342, Sep. 15, 1975, abandoned. This application Jan. 26, 1979, Ser. No. 6,637
Int. Cl.³ B22D *17/10*
U.S. Cl. 164—149 **4 Claims**

1. In a molten metal injection device for a cold chamber type die casting machine, wherein a cavity is provided in which a metal cast body is formed between a movable die and a stationary die, and molten metal is injected by a reciprocatable piston through an injection sleeve into said cavity through a narrow gate, said sleeve having an inserting end for said piston and an oppositely disposed gate end and having a feeding port for said molten metal, the improvement which comprises at least one open aperture provided in said sleeve between said feeding port and said inserting end in which the sliding surface of said



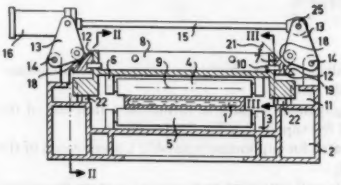
piston is partially exposed when near said inserting end, first nozzle means arranged for spraying lubricant through said aperture onto at least the forward portion of said exposed surface of said piston, and second nozzle means arranged for directing compressed air through said aperture onto said exposed surface of said piston at sufficient pressure for removing adhered metal deposits from said exposed surface.

4,223,719

ROLLER APRON FOR A CONTINUOUS CASTING INSTALLATION

Hans Riederer, Maienfeld; Adolf Fuchs, Wädenswil, both of Switzerland, and Raymond Vial, Lorette, France, assignors to Concast AG, Zürich, Switzerland

Filed Nov. 28, 1977, Ser. No. 855,165
Claims priority, application France, Dec. 8, 1976, 76 36930; Switzerland, Mar. 15, 1977, 3191/77
Int. Cl.³ B22D *11/12*
U.S. Cl. 164—448 **17 Claims**



1. Roller apron for a continuous casting plant for supporting a partially solidified cast strand, especially a steel strand, comprising:

a rigid machine frame;

a plurality of pairs of rolls which follow one another in succession in the direction of travel of the cast strand;

a traverse;

bearings for rotatably mounting the rolls;

the bearings of at least one roll being arranged upon said traverse;

said traverse extending essentially parallel to the lengthwise axis of said at least one roll supported thereby;

stop means cooperating with the traverse for governing the cross-sectional thickness of the cast strand;

means for applying the traverse against said stop means;

said applying means comprising first and second pivotable levers cooperating with a respective opposite end of the traverse;

a movement device;

each pivotable lever being hingedly connected directly at both said rigid machine frame and said movement device;

said movement device comprising a power source interconnecting both of the pivotable levers with one another;

said power source applying force components effective essentially parallel to the lengthwise axes of the rolls at both pivotable levers and thus applying the traverse elastically against said stop means in the direction of the cast strand and enabling said traverse to automatically move away from said stop means when subjected to a predetermined load limit correlated for said traverse.

4,223,720

VEHICLE AIR CONDITIONING DEVICE

Emmanuel J. Poirier d'Ange d'Orsay, Toulouse, and René H. Paradis, Nogent le Rotrou, both of France, assignors to Societe pour l'Equipement de Vehicules, Issy les Moulineaux and Societe Anonyme Francaise du Ferodo, Paris, both of, France

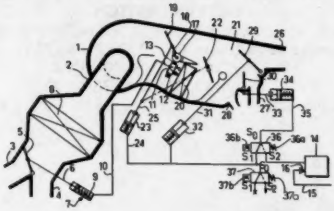
Filed Apr. 10, 1978, Ser. No. 895,029

Claims priority, application France, Apr. 15, 1977, 77 11483

The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.

Int. Cl.[3] F25B *29/00*

U.S. Cl. 165—14 **23 Claims**



1. A device for air conditioning an enclosed space, to give at least one mode of automatic control, such device comprising: an air circulating fan; heat exchanger means through which the conditioning air can pass; means defining different possible circulation paths for the conditioning air propelled through the device by said fan; movable means for selectively directing the flow of conditioning air along said different possible circulation paths; fluid pressure controlled actuator means for said movable means; electromagnetic valve means for controlling said actuator means; and means responsive to the mode of air conditioning control selected by the user, for supplying said electromagnetic valve means either with a continuous electrical signal or with a low frequency discontinuous electrical signal.

4,223,721

HEAT STORAGE CONTAINERS FILLED WITH THE COMBINATION OF A EUTECTIC SALT AND A NON-BIODEGRADABLE FILLER MATERIAL

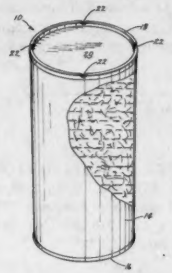
James L. Schoenfelder, Coralville, Iowa, assignor to Solar, Inc., Iowa City, Iowa

Filed Sep. 26, 1977, Ser. No. 836,486

Int. Cl.[2] F28D *21/00*

U.S. Cl. 165—104 S **7 Claims**

1. A heat storage article adapted for prevention of stratification of a heat storage material comprising in combination, a container element of a highly thermally conductive material, an internal cavity in said container element, said internal cavity being substantially completely filled with the combination of an inert non-biodegradable bulky material and a eutectic salt, said material being substantially inert when in contact with said eutectic salt,



said inert non-biodegradable bulky material being fiber glass insulation, and said material fills from about 10% to about 30% by volume of the internal cavity of said containers.

4,223,722

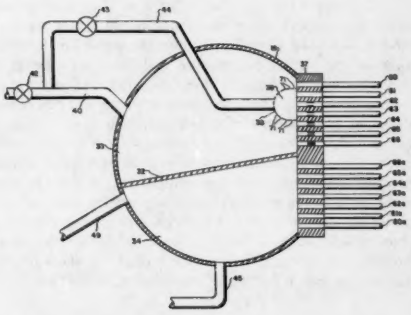
CONTROLLABLE INLET HEADER PARTITIONING

Russell L. Shade, Jr., Cape Elizabeth, Me., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 2, 1978, Ser. No. 947,658

Int. Cl.[3] F28B *9/02*; F28F *9/22*; F28D *7/06*

U.S. Cl. 165—111 **16 Claims**



1. In a tube and shell reheater having a vapor-tight shell, inlet means for passing cool wet shellside steam thereinto, means within said shell for removing entrained moisture from said shellside steam, and outlet means for removing reheated shellside steam therefrom, at least one reheater therein for raising the temperature of said dried shellside steam, said reheater comprised of an inlet header, including a tubesheet, an outlet header, and a plurality of substantially parallel heat-exchange tubes comprising a tube bundle connected therebetween and extending within said shell between said inlet and said outlet means and in heat-transfer relationship with said shellside steam, the improvement comprising: first means supplying said inlet header with a supply of saturated steam at a temperature and at a pressure both of which are higher than the corresponding characteristic of shellside steam passed into said shell for reheating; partition means within said inlet header for creating therein an auxiliary inlet header which is coupled with and covers inlet ends of a preselected group of said tubes at said tubesheet; separate means for supplying a controllable supply of saturated steam at essentially the same temperature and pressure as said first steam supply means to said auxiliary inlet header; variable flow control means associated with said second steam supply means for controlling the flow rate of saturated steam into said auxiliary header and for indepen-

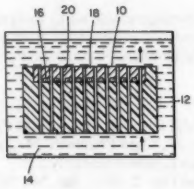
dently controlling steam flow rates in said preselected group of tubes; said flow control means being responsive to the loading of said reheater and effective to maintain flow rates in all of said tubes sufficient to substantially eliminate condensate subcooling therein at all values of reheater loading without requiring excessive scavenging steam flow rates in any of said tubes.

4,223,723

HEAT TRANSFER IN BOILING LIQUIFIED GAS

Mohamed A. Hilal, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Jan. 12, 1978, Ser. No. 869,019
Int. Cl.[2] F28F *13/02*
U.S. Cl. 165—133 **9 Claims**



1. Means for increasing heat transfer characteristics between a boiling liquid and the surface of a solid at a temperature above the temperature of the boilng liquid and in which the solid is immersed whereby an unstable vapor film ordinarily forms at the surface to interfere with the heat transfer efficiency between the surfaces of the solid and the liquid comprising providing means for eliminating at least a part of any unstable vapor film which forms on the surface of said solid, said means consisting essentially of a multiplicity of passages which extend through the solid to openings at the surface of said solid in which the openings are dimensioned to constitute up to 1% of the surface area and with the passages being dimensioned to enable circulation of liquid through said passages for emergence as a liquid from the openings at the surface for passage through any unstable vapor film formed on the surface to eliminate at least a portion of the unstable vapor film.

4,223,724

DEVICE FOR CLEANING, WIDENING AND REPAIRING WELLS OF DRINKING WATER AND IRRIGATION WATER

Carlo F. Levoni, and Gian P. Levoni, both of Caretera Negra, 97, Apartado 47, Anaco, Venezuela

Filed Dec. 19, 1977, Ser. No. 862,055
Claims priority, application Italy, Dec. 22, 1976, 40167 A/76
Int. Cl.[2] E21B *37/00, 43/00*
U.S. Cl. 166—68 **7 Claims**

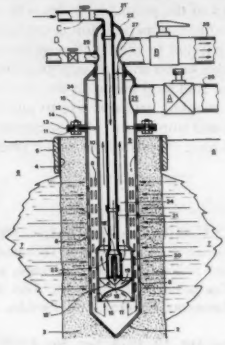
7. A device for discharge from wells of earth blocks clogging the well-filter and also the pebble gravel well-filter, comprising:

a first pipe section capable of being extended downwardly by means of other sections screwed to it;

a second pipe coaxially surrounded by said first pipe section and terminating at the bottom with a tapered conical end, said second pipe having a plurality of slits slanted upwardly at the lower end thereof;

a pipe fitting connected to the top of said first pipe section and coupled to said second pipe with a vertical sliding fit;

a discharge pipe, connected to extend radially from said pipe fitting; and



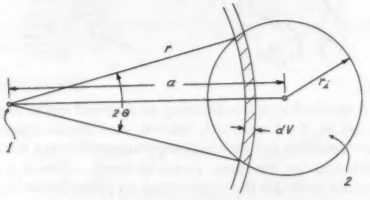
an air supply pipe coupled to said second pipe to inject compressed-air thereinto.

4,223,725

METHOD FOR RESERVOIR FLUID DRIFT RATE DETERMINATION

Thomas S. Teasdale, and Wilton T. Adams, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,837
Int. Cl.[2] F21B *47/10*
U.S. Cl. 166—250 **9 Claims**



1. In an underground reservoir penetrated by at least one well, a method for determining the magnitude of fluid drift rate in the reservoir consisting essentially of:

a. injecting into a well which penetrates said reservoir a known volume of a fluid containing a tracer chemical,

b. shutting in said well for a period of time to allow movement of the injected tracer containing fluid,

c. producing said well while systematically analyzing produced fluid samples to determine the produced tracer concentration, and

d. calculating therefrom the magnitude of the fluid drift rate in the reservoir.

4,223,726

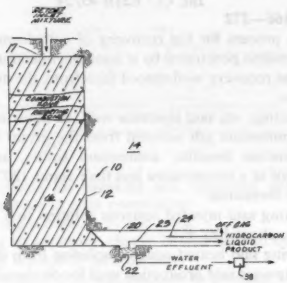
DETERMINING THE LOCUS OF A PROCESSING ZONE IN AN OIL SHALE RETORT BY EFFLUENT WATER COMPOSITION

Chang Y. Cha, Bakersfield, Calif., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.

Continuation of Ser. No. 867,642, Jan. 6, 1978, abandoned. This application Feb. 28, 1979, Ser. No. 16,459
Int. Cl.[2] E21B *43/24, 47/00*
U.S. Cl. 166—251 **30 Claims**

1. A method for determining the locus of a processing zone as it advances through a fragmented permeable mass of parti-

cles containing oil shale in an in situ oil shale retort formed in a subterranean formation containing oil shale, the retort having boundaries of unfragmented formation, comprising the steps of assaying the subterranean formation at selected locations for the content of at least one precursor for at least one selected constituent resulting from advancement of the processing zone through the formation;



predicting the concentration of the selected constituent in effluent water from the retort due to processing of the fragmented mass in at least a portion of such locations;

monitoring the effluent water withdrawn from the fragmented mass during retorting for the presence of the selected constituent; and,

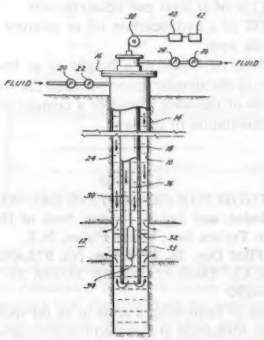
correlating the concentration of the selected constituent with such predicted concentrations for determining the locus of the processing zone in the retort.

4,223,727

METHOD OF INJECTIVITY PROFILE LOGGING FOR TWO PHASE FLOW

Alvin J. Sustek, Jr., and Terry L. Frazier, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jun. 22, 1979, Ser. No. 51,094
Int. Cl.[2] E21B *47/00, 49/00*
U.S. Cl. 166—250 **10 Claims**



1. A method of making a permeability log of a subsurface formation traversed by a bore hole which comprises:

(a) injecting a two phase fluid into the bore hole above said formation, said two phase fluid containing an effective amount of one radioactive substance which combines almost exclusively with the gas phase of the injected two phase fluid;

(b) simultaneously injecting the two phase fluid which contains an effective amount of a second radioactive substance which combines almost exclusively with the liquid phase of the injected two phase fluid into the bore hole below the formation;

(c) establishing an upper gas phase interface and a lower liquid phase interface between the two fluids;

(d) determining the depth in the hole of said interfaces by measuring the radioactivity of the fluids throughout that portion of the hole being examined;

(e) then varying the ratio of the rates at which the two fluids of steps (a) and (b) are injected into the hole while maintaining the sum of the two rates as nearly constant as possible so as to cause said interfaces to move along the walls of the bore hole to another depth;

(f) determining the depth of the interfaces produced by the method of step (d); and

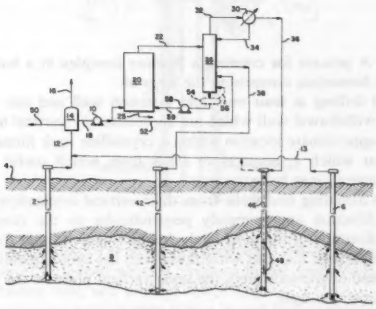
(g) repeating steps (e) and (f) until a series of depth and injection rated measurements at the various interfaces sufficient to adequately describe the formation is obtained for both phases of the injected two phase fluid.

4,223,728

METHOD OF OIL RECOVERY FROM UNDERGROUND RESERVOIRS

David R. Pegg, Ojai, Calif., assignor to Garrett Energy Research & Engineering Inc., Ojai, Calif.

Filed Nov. 30, 1978, Ser. No. 964,880
Int. Cl.[2] E22B *43/22*
U.S. Cl. 166—266 **23 Claims**



1. A method of oil recovery comprising:

providing a field oil cracking unit near an oil formation having one or more wells, said cracking unit adapted to produce light and intermediate hydrocarbons at pressures for direct injection into the oil formation;

said cracking unit comprising a cracker connected to said wells for cracking oil, said cracker including an overhead condensing means for separating said light from the intermediate or heavier hydrocarbons;

said cracker comprising a thermal cracking device for small scale, high pressure hydrocarbon liquid phase cracking from a slurry having a high coke density employing the characteristics of a growth-type crystallizer;

said device including a cracker chamber having an effective volume to provide a high liquid residence time per pass and a long coke residence time;

heating means including heater tubes through which said slurry passes;

means to circulate said slurry through said tubes whereby a low temperature differential between said slurry and tubes will be maintained to minimize fouling and control coking;

contacting oil in said formation with the light and intermediate hydrocarbons by injecting said hydrocarbons into the formation through at least one of said wells; and

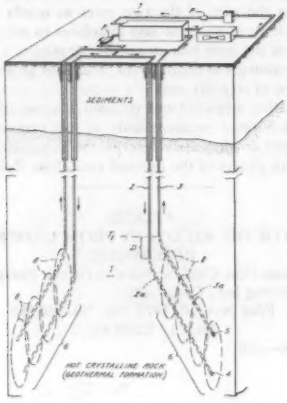
displacing said oil in the formation with said hydrocarbons and causing flow of the oil to at least one of said wells.

4,223,729

METHOD FOR PRODUCING A GEOTHERMAL RESERVOIR IN A HOT DRY ROCK FORMATION FOR THE RECOVERY OF GEOTHERMAL ENERGY

John W. Foster, 2 Highlands Close, Crowborough, Sussex, England

Filed Jan. 12, 1979, Ser. No. 3,389
Int. Cl.[2] E21B *43/26*; F28D *21/00*
U.S. Cl. 166—271 7 Claims



1. A process for creating a fracture complex in a hot dry rock formation, comprising the steps of:

(a) drilling at least one fluid injection well and one fluid withdrawal well which are approximately vertical to the approximate location within a crystalline rock formation at which a temperature exists from which useful heat energy may be extracted;

(b) deviating said wells from their vertical orientation in a direction approximately perpendicular to the compass direction of the most likely fracture plane of said formation such that said withdrawal well lies above, parallel to and in approximately the same vertical plane as the fluid injection well;

(c) simultaneously fracturing said formation from said injection and withdrawal wells to produce a single interconnecting fracture of large surface area connecting said wells for hydraulic communication.

4,223,730

METHOD FOR THE TERTIARY RECOVERY OF PETROLEUM BY FLOODING WITH HOT WATER AND AN AQUEOUS ALKALINE SOLUTION

Walther Schulz, Vechta, and Wilhelm Gebetsberger, Barnstorf, both of Fed. Rep. of Germany, assignors to Wintershall Aktiengesellschaft, Kassel, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 760,433, Jan. 18, 1977, abandoned. This application Jun. 23, 1978, Ser. No. 918,555
Claims priority, application Fed. Rep. of Germany, Jan. 23, 1976, 2602450
Int. Cl.[3] E21B *43/22, 43/24*
U.S. Cl. 166—272 9 Claims

1. A method for the tertiary recovery of petroleum by hot water flooding or flooding with alkaline, water-soluble materials in the deposits, which, after the hot water flooding into the deposit heated by hot water, is comprised by admitting an aqueous soda lye solution at ambient temperature as the flooding agent into the deposit heated by the hot water, and adjusting the upper temperature limit of said deposit to such a degree that the resulting emulsion formed from the petroleum with the soda lye remains practically stable.

4,223,731

METHOD FOR ENHANCED RECOVERY OF PETROLEUM

John H. Estes, Wappingers Falls, and Ernest P. Buinicky, Newburch, both of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 931,693, Aug. 7, 1978. This application Nov. 24, 1978, Ser. No. 963,617
Int. Cl.[2] E21B *43/24*
U.S. Cl. 166—272 13 Claims

1. In a process for the recovery of petroleum oil from an earth formation penetrated by at least one injection well and by at least one recovery well spaced therefrom, the method which comprises:

(a) injecting, via said injection well, an aqueous solution of an ammonium salt selected from the group consisting of ammonium bisulfite, ammonium sulfite, and mixtures thereof at a temperature less than about 120° F. into said earth formation;

(b) heating said injected aqueous solution to a temperature above about 120° F.;

(c) driving said heated aqueous solution from said injection well toward said production well for displacing petroleum oil from said earth formation; and

(d) producing said displaced petroleum oil from said recovery well.

4,223,732

MICROEMULSIONS FOR USE AS SPACES IN WELL CEMENTATION

Jean Carriay, Le Fauga, and Jacques de Lautrec, St-Gaudens, both of France, assignors to Societe National Elf Aquitaine (Production), Courbevoie, France

Filed Sep. 7, 1978, Ser. No. 940,302
Claims priority, application France, Jul. 8, 1977, 77 21094
Int. Cl.[2] E21B *33/16*
U.S. Cl. 166—291 7 Claims

1. A method for the cementation of oil wells which have been drilled with the use of an oil base slurry which comprises:

(1) positioning a well casing in the well;

(2) injecting a microemulsion comprising by weight

(a) 10–20% of an amphoteric surfactant

(b) 10–15% of at least one co-surfactant

(c) 3–45% of a hydrocarbon oil or mixture of hydrocarbon oils, and

(d) 30–80% of water to a height of at least about 100 meters in the annular space between the well casing and the side of the well, ahead of a cement grout intended for cementation of the well.

4,223,733

METHOD FOR CEMENTING OIL WELLS

Edward E. Bodor, and Joy T. Payton, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,490
Int. Cl.[2] C04B *7/35*; E21B *33/138, 33/14*
U.S. Cl. 166—293 5 Claims

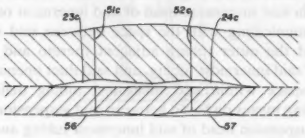
1. A method of cementing a zone in an oil well penetrating a subterranean formation at elevated temperatures up to about 96° C. comprising injecting down the well and positioning in the zone to be cemented a hydraulic cement aqueous slurry composition comprising dry hydraulic cement, sufficient water to form a pumpable slurry and a cement retarding additive consisting of from about 0.2 to about 1.0 percent by weight, based on the dry hydraulic cement component, of a zinc salt selected from the group consisting of zinc chloride, zinc oxide and zinc sulfate and from about 0.2 to about 1.0 percent by weight of a water soluble ammonium, alkali or alkaline earth metal salt of an alkaryl sulfonic acid, and allowing the composition thus positioned to set to a monolithic mass.

4,223,734

PROCESS OF BREAKING AND RENDERING PERMEABLE A SUBTERRANEAN ROCK MASS

Mitchell A. Lekas, Concord, Calif., assignor to Geokinetics Inc., Concord, Calif.

Filed Nov. 9, 1978, Ser. No. 959,070
Int. Cl.[2] E21B *43/263;* E21C *43/00;* E21B *43/28*
U.S. Cl. 166—299 **10 Claims**



4. The process for breaking and rendering permeable a subterranean mass of rock comprising:

hydrofracing a fracture in said mass;

emplacing an explosive charge in said mass in spaced confronting relation to said fracture;

firing an explosive in said fracture to produce a transitory enlargement thereof and a free face confronting said charges; and

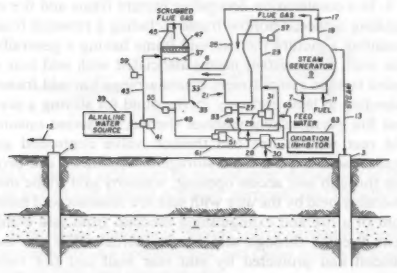
exploding said charge during the period of said enlargement and against said free face for fragmenting said rock and to distribute said space, thus producing a chamber filled with fractured pervious rubble-ized rock.

4,223,735

PETROLEUM PRODUCTION TECHNIQUE UTILIZING A HOT AQUEOUS FLUID

Paul L. Caldwell, Jr., Aurora, Colo., and Earl S. Snavely, Jr., Arlington, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,550
Int. Cl.[2] E21B *43/24;* C01B *17/62;* C01F *11/48*
U.S. Cl. 166—303 **9 Claims**



1. A method of producing petroleum from a petroleum-bearing formation penetrated by a well means comprising:

(a) generating a hot aqueous fluid by injecting feed water into a hot aqueous fluid generator and firing said hot aqueous fluid generator with a sulfur-containing fuel, said hot aqueous fluid generator emitting a flue gas containing sulfur oxides;

(b) injecting said hot aqueous fluid via said well means into said petroleum-bearing formation;

(c) producing petroleum via said well means from said petroleum-bearing formation;

(d) flowing said flue gas containing sulfur oxides through a venturi scrubber vessel and thereafter through an emission scrubber vessel;

(e) flowing alkaline water having a pH of at least 7 into said emission scrubber vessel and therethrough in counterflow with said flue gas to remove sulfur oxides therefrom and form sulfites;

(f) discharging from said emission scrubber vessel alkaline water having a pH greater than 6 and flowing said alkaline water of a pH greater than 6 into said venturi scrubber vessel above a venturi therein and therethrough with said flue gas to remove sulfur oxides therefrom and form sulfites;

(g) discharging alkaline water having a pH within the range of about 5 to 6 from said venturi scrubber vessel below said venturi; and

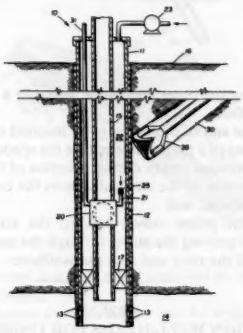
(h) discharging said flue gas having sulfur oxides removed therefrom from said emission scrubber vessel.

4,223,736

METHOD FOR SHUTTING IN A PRODUCTION WELL

C. Mackay Foster, Jr., Denton, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 21, 1979, Ser. No. 13,712
Int. Cl.[3] E21B *34/06, 43/12*
U.S. Cl. 166—315 **3 Claims**



1. A method for shutting in a producing well in response to a loss of a defined annulus pressure in the wellbore of said producing well, said method comprising:

positioning a production tubing in said well to fluidly communicate a producing formation in said producing well to the surface;

isolating the annulus between said wellbore and said production tubing above the production formation from said formation;

placing a valve in said production tubing to control flow therethrough at a point above said isolated production formation, said valve adapted to remain in an open position when the pressure in said annulus above said isolated production formation exceeds said defined value and adapted to close when the pressure in said annulus decreases below said defined value;

filling said annulus above said isolated production formation with a noncompressible fluid; and

applying said defined pressure to said fluid wherein said defined pressure is substantially greater than the mud column pressure of a second well being drilled in the proximity of said producing well.

4,223,737

METHOD FOR WELL OPERATIONS

Dale O'Reilly, 1006 Honey Hill, Houston, Tex. 77077

Filed Mar. 26, 1979, Ser. No. 23,540
Int. Cl.[3] E21B *7/12*
U.S. Cl. 166—362 **4 Claims**

1. A method for running a string of pipe into a wellbore

having its mouth on the seafloor wherein the wellbore is full of drilling mud including the steps of

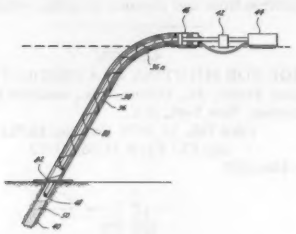
securing a template over the mouth of the wellbore,

connecting to the template one end of a riser that arcs from the sea surface to the template,

connecting the other end of the riser on the surface to a mud return vessel,

filling the wellbore to a desired level with cement, the cement displacing a proportionate amount of drilling mud upward

positioning one end of the string of pipe movably in the mud return vessel,



connecting the other end of the string to a prime mover on the surface,

sealing the end of the string to be inserted into the wellbore by means of a plug to insure that the space enclosed by the string remains empty during insertion of the string, so that the insertion of the string displaces the cement upward in the wellbore, and

moving the prime mover toward the mud return vessel thereby moving the string through the mud return vessel, through the riser and into the wellbore.

4,223,738

PRODUCTION WELL-HEADS FOR UNDERWATER OIL WELLS

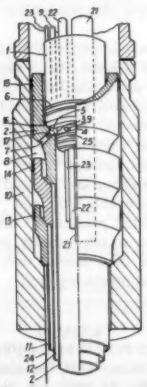
Jean-Pierre L. Boutet, Paris, and Francois C. Gueuret, Boulogne Billancourt, both of France, assignors to Compagnie Francaise des Petroles, Paris, France

Filed Sep. 28, 1978, Ser. No. 946,920

Claims priority, application France, Sep. 29, 1977, 77 29256

Int. Cl.[2] E21B *7/12*

U.S. Cl. 166—368 **8 Claims**



1. In a production well-head for an underwater oil well comprising a housing, a plurality of concentric tubings each provided with a suspension head, sealing means between each suspension head and said housing, a production tube, a suspension member for suspending said production tube from a suspension head of an innermost one of said tubings, said suspension member having a frusto-conical surface bearing on a frusto-conical surface of said suspension head of the innermost one of said tubings, and cement means for sealing between said innermost tubing and an outer tubing adjacent thereto at the lower end thereof, the improvement characterized by: a duct provided in said suspension head of said innermost tubing, said duct communicating with the space between said innermost tubing and the outer tubing adjacent thereto and with the interior of said innermost tubing, and said duct opening into an auxiliary space within said innermost tubing delimited by upper sealing means disposed between said suspension member and said suspension head of said innermost tubing and a lower sealing means bearing against said innermost tubing.

4,223,739

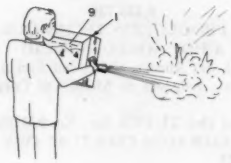
PICTURE FRAME WITH FIRE EXTINGUISHING MEANS ASSOCIATED THEREWITH

Donald R. Waters, 641 Mariclaire Ave., Vandalia, Ohio 45377

Filed Mar. 9, 1979, Ser. No. 19,171

Int. Cl.[3] A62C *25/00*

U.S. Cl. 169—52 **8 Claims**



1. In a combination decorative picture frame and fire extinguishing device, a hollow frame including a recessed front for mounting a picture therein, said frame having a generally flat rear wall, fire resistant means associated with said rear wall, sealed storage compartment means arranged in said frame and extending at least part way therearound for storing a pressurized fire extinguishing medium therein, an access opening in said rear wall at one end thereof, valve controlled nozzle means associated with said storage compartment and projectable through said access opening, whereby said frame may be reversibly held by the user with said fire resistant wall means in front of a fire and extinguishing medium from said compartment directed through said nozzle thereat while the user is shielded and protected by said rear wall and fire resistant means.

4,223,740

FIRE FIGHTING NOZZLE UNITS

Maurice A. Clayton, 12235 S. Stewart, Chicago, Ill. 60628

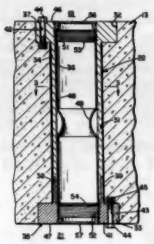
Filed May 10, 1978, Ser. No. 904,423

Int. Cl.[2] A62C *31/02*

U.S. Cl. 169—70 **11 Claims**

1. In a building structure comprising a series of rooms, each room having a ceiling wall, a floor wall and side walls, a flow control nozzle unit mounted in at least one of said walls, said unit being accessible externally of the room and formed at its end outside the room for coupling to a fluid conducting conduit and a cover on the inner end of said nozzle unit substan-

tially flush with the adjacent wall surface, said cover being removable and having such weakened connection to the nozzle



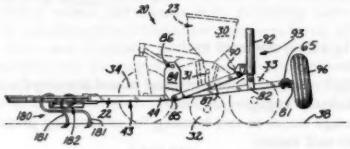
unit that it will be blown out by fluid pressure within the unit when a fluid supply hose is coupled to the other end of the unit.

4,223,741

VEHICLE FOR AGRICULTURAL USE WITH TRANSPORT WHEELS

Harold Blumhardt, Ashley, N. Dak., assignor to Blumhardt Mfg., Inc., Ashley, N. Dak.

Filed Mar. 3, 1978, Ser. No. 883,275
Int. Cl.[3] **A01B** *63/22, 37/00, 73/00*
U.S. Cl. 172—240 **3 Claims**



1. In a wheeled vehicle to be moved over the surface of the ground in first and second mutually perpendicular directions, in combination:

an agricultural implement having earth-working wheels, rotatable about a common axis, and caster wheels laterally spaced from said common axis;

a frame having first and second sides extending in said first direction and first and second ends extending in said second direction;

means mounting said frame on said implement for rotation about a pivotal axis extending in said first direction and located between said caster wheels and said common axis, with said first side of said frame extending laterally beyond said caster wheels and said second side of said frame extending laterally beyond said earth-working wheels;

a plurality of transport wheels spaced along said second side for tracking in said first direction; and

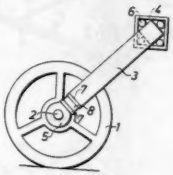
reversible means for causing pivotal movement of said frame with respect to said implement, raising or lowering said second side of said frame to transfer a portion of the weight of said implement between said earth-working wheels and said transport wheels.

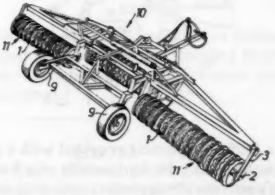
4,223,742

RESILIENT ARRANGEMENT IN A RING ROLLER ALLOWING RINGS TO ADAPT TO GROUND IRREGULARITIES

Karl G. C. Stark, Väderstad Herrgard, S-59021 Väderstad, Sweden

Filed Mar. 24, 1978, Ser. No. 890,196
Claims priority, application Sweden, Apr. 14, 1977, 7704263
Int. Cl.[3] **A01B** *29/04, 73/00*
U.S. Cl. 172—456 **4 Claims**





1. An arrangement in a ring roller intended to be towed by a tractor and including

hingeable outboard sections which can be folded upward, and

a middle section provided with at least one wheel arranged to be let down to keep the roller lifted when the roller is towed on a substructure, a frame included with each of said sections,

rings being included in said middle section and each said outboard section, said rings being arranged on each section on at least one common shaft pertaining to the respective section,

elongated swinging arms being provided, the ends of each said shaft being rotatably mounted in bearings at the lower free ends of respective ones of said arms, which said arms are mounted on and extend at an angle downward from the frame of each said section,

the shaft carrying the rings of a specific said section being connected to the frame of said section by said arms, said arms having means allowing the shaft and frame to each have mutual angular displacement relative to the longitudinal axis of each of said arms, in which said angular displacement allowing means includes a first resilient means allowing the arms carrying the shaft of said specific section to undergo a resiliently limited pivoting movement with respect to said frame along an axis lying in a forward facing vertical plane intersected by said arms, and a second resilient means spaced from said first resilient means and allowing each said arm to twist about its longitudinal axis in response to angular displacement of the arm relative to its longitudinal axis caused by the shaft tilting from the horizontal

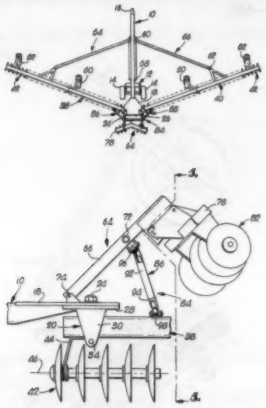
and thereby allowing the shaft with its rings to adapt itself to the irregularities of the ground irrespective of the relative angular relationship of the interconnected frames.

4,223,743

FOLDABLE IMPLEMENT WITH RAISABLE TOOL ASSEMBLY

Harold K. Garrison, Newton, Kans., assignor to Hesston Corporation, Hesston, Kans.

Filed Jun. 9, 1978, Ser. No. 914,076
Int. Cl.[3] A01B *21/08, 73/00*
U.S. Cl. 172—583 **9 Claims**



1. In a folding implement provided with a pair of tool supporting beams swingable horizontally on a frame of the implement between laterally oppositely extending working positions and generally fore-and-aft extending transport positions with respect to the normal path of travel of the implement, the improvement comprising:

a tool assembly mounted on the frame for vertical swinging movement between raised and lowered positions; and

structure operatively coupling said beams with said assembly and responsive to swinging of the beams between said positions thereof to raise the assembly to said raised position each time the beams are swung to said transport positions and to lower the assembly to said lowered position each time the beams are swung to said working positions.

4,223,744

REVERSING HAMMER DRILL

James L. Lovingood, Pickens, S.C., assignor to The Singer Company, Stamford, Conn.

Filed Aug. 3, 1978, Ser. No. 930,776
Int. Cl.[3] E02D *7/02*
U.S. Cl. 173—48 **5 Claims**

1. A bypass switch assembly for a reversing hammer drill comprising:

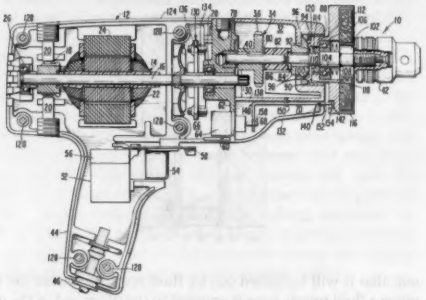
a. a housing,

b. a motor journaled in the housing,

c. a hammer drill mechanism selectively operable as a drill or as a hammer drill,

d. a trigger switch in circuit with the motor to turn the motor on and off,

e. a reversing switch adapted to set the motor for rotation in the forward or reverse direction, and



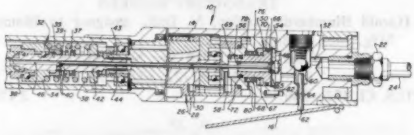
f. a bypass switch in circuit between the motor and the trigger switch selectively to connect the reversing switch in circuit with the motor or to shunt the reversing switch.

4,223,745

TORQUE RESPONSIVE MOTOR SHUTOFF MECHANISM FOR FLUID OPERATED TOOL

William Workman, Jr., Spring Lake, Mich., assignor to Cooper Industries, Inc., Houston, Tex.

Filed Sep. 15, 1978, Ser. No. 942,519
Int. Cl.[3] B23Q *5/06;* **B25B** *23/145*
U.S. Cl. 173—12 **4 Claims**



1. In a fluid operated tool:

a housing;

a fluid operated motor disposed in said housing for driving a fastener engaging member;

passage means in said housing for conducting pressure fluid to said motor;

an operator actuated motive fluid supply valve interposed in said passage means;

a torque sensing mechanism drivenly connected to said motor; and,

a motive fluid shutoff valve interposed in said passage means between said supply valve and said motor, and operable to be in a valve closed condition to prevent flow of motive fluid to said motor and a valve open condition to permit flow of motive fluid to said motor when said supply valve is opened, said shutoff valve including a movable closure member and a movable seat;

means interconnecting said closure member and said torque sensing mechanism for holding said closure member in a first closure member position and for allowing said closure member to move to a second closure member position in response to a predetermined torque exerted on said torque sensing mechanism,

said seat including means for moving said seat to a first seat position in response to the admission of pressure fluid to said passage means to permit the flow of pressure fluid to said motor when said closure member is in said first closure member position, said closure member being operable in response to a predetermined torque exerted on said torque sensing mechanism to move to said second closure

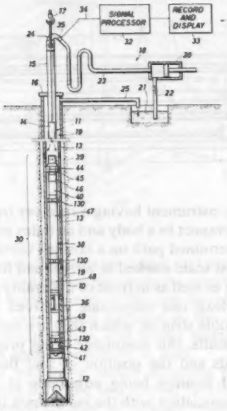
member position to engage said seat to shut off motive fluid flow to said motor, and means for causing said seat to move said closure member to said first closure member position upon closure of said supply valve.

4,223,746

SHOCK LIMITING APPARATUS

Denis R. Tanguy, Houston, and Larry J. Leising, Rosenberg, both of Tex., assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Jan. 29, 1979, Ser. No. 7,526
Int. Cl.[2] E21B *17/02, 47/00;* F16F *9/18*
U.S. Cl. 175—40 **17 Claims**



17. Apparatus for use in making measurements during the drilling of a well, comprising a tubular body adapted to be connected in a drill string; an instrumentality including means for making said measurements; and means for mounting said instrumentality within said tubular body including means responsive to a combination of hydrostatic pressure force, orifice damping force and Coulomb friction force for limiting to a predetermined level the magnitude of acceleration and deceleration forces to which said instrumentality may be subjected when said tubular member is subjected to an axial shock load.

4,223,747

DRILLING USING REVERSE CIRCULATION

Lionel R. Marais, Paris, France, assignor to Compagnie Francaise des Petroles, Paris, France

Filed Oct. 26, 1978, Ser. No. 954,804
Claims priority, application France, Oct. 27, 1977, 77 32448
Int. Cl.[2] E21B *3/00*
U.S. Cl. 175—65 **7 Claims**

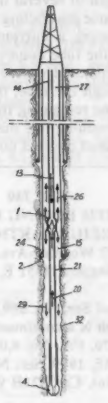
1. A method of earth boring, comprising the steps of:

(a) pumping clean drilling fluid down through the hollow interior of a set of upper pipes in a string to a level above the lowest one of a plurality of casing members lining a bore hole,

(b) unidirectionally ejecting a first portion of the clean drilling fluid at said level into a first annular space below said level between an unlined, lower portion of said bore hole and a set of lower pipes in said string connected to a drilling tool at the bottom of the string,

(c) reversing the direction of a second portion of the clean drilling fluid at said level,

(d) ejecting said second portion of the clean drilling fluid through upwardly directed Venturi nozzle means in communication with the hollow interior of said set of lower pipes and drilling tool, whereby a reduced pressure is established at the outlet of said nozzle means which draws drilling fluid contaminated with earth cuttings at said drilling tool up through the interior of said set of lower pipes, and



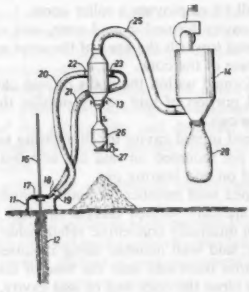
(e) unidirectionally ejecting said contaminated drilling fluid and said second portion of the clean drilling fluid into a second annular space between said set of upper pipes and said casing members.

4,223,748

METHOD OF COLLECTING DUST DURING ROCK DRILLING AND A DUST COLLECTING SUCTION SYSTEM FOR A ROCK DRILLING APPARATUS

Pieter Barendsen, Tyresö, Sweden, assignor to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Dec. 4, 1978, Ser. No. 965,747
Claims priority, application Sweden, Dec. 8, 1977, 7713916
Int. Cl.[3] C09K *7/00*
U.S. Cl. 175—66 **12 Claims**



10. Method of collecting dust during rock drilling comprising:

collecting the dust-loaded air that flows out of the borehole,

separating most of the dust as a coarse fraction by passing same through a passage having a sharp bend therein to divert air flowing therethrough, the coarse dust, because of its inertia, not being diverted through said sharp bend,

filtering the dust loaded air from which the coarse fraction has been removed to collect the remaining fine dust,

cleaning the separated coarse dust from remaining fine dust mixed therewith by a current of air that is then mixed with the air that is to be filtered in order to remove fine dust

collected and carried by the current of air, the cleaning step comprising passing the separated coarse dust downwardly through a substantially vertical elongated tube which has a length of several times the diameter thereof, the separated coarse dust falling substantially freely in said tube, and producing a current of atmospheric air upwardly through the tube counter-current to the direction of fall of said separated coarse dust to clean the coarse dust falling through the tube, the upward current of air, which contains the remaining fine dust then being filtered to collect the remaining fine dust therefrom, and then dumping the separated cleaned coarse dust on the ground.

4,223,749

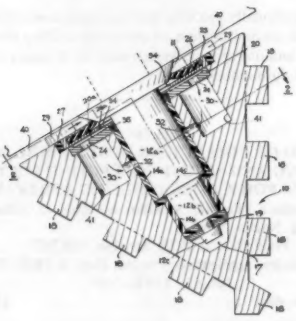
ROTARY EARTH BORING DRILL BIT WITH CENTRIFUGAL FOREIGN PARTICLE BARRIER DEVICE

Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif. 91406, and Ernest A. von Seggern, 1051 E. Angeleno Ave., Burbank, Calif. 91501

Continuation-in-part of Ser. No. 889,939, Mar. 24, 1979, Pat. No. 4,156,470, which is a continuation-in-part of Ser. No. 698,286, Jun. 21, 1976, Pat. No. 4,091,988. This application Mar. 15, 1979, Ser. No. 20,807

Int. Cl.[2] E21B *9/35*

U.S. Cl. 175—227 **1 Claim**



1. In a drill bit employing a roller cone,

a central cavity formed in said cone, said cavity having a closed end towards the apex of the cone and an open end at the base of the cone,

bearings formed within the walls of said cavity with a peripheral portion of said cavity outside the periphery of said bearings,

oil contained in said cavity for lubricating said bearings,

a bearing pin mounted on said bit, said bearings rotatably mounted on said bearing pin,

a disc-shaped wall member forming a slinger disc having a central aperture formed therein through which the pin passes in internally concentric relationship with said wall member, said wall member being mounted on said cone for rotation therewith near the base of the cone so as to partially close the open end of said cavity,

port means including an opening formed in an outer peripheral portion of said wall member for providing fluid communications between said cavity and the outside environment of the cone, and

a second disc-shaped wall member mounted on said cone for rotation therewith and positioned opposite the outer peripheral portion of said first mentioned wall member in parallel relationship thereto, a narrow radial annular passage being formed between said wall members, said second wall member operating to trap said oil and minimize its escape from said cavity when the cone is stationary,

whereby particulate material entering from outside the bit is forced outwardly by the centrifugal force generated by the disc-shaped member with the rotation of the cone so as to pass through the opening in said wall member and is centrifugally trapped in said outer peripheral portions of said cavity away from said bearings.

4,223,750

WEIGHTING INSTRUMENT FOR DIETETIC USE

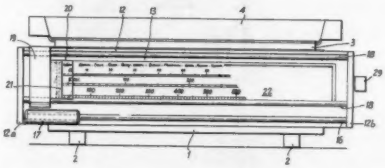
Jean-Claude Perego, Monthodon, France, assignor to Jean-Jacques Menage, Tours, France and Francois Le Bars, Chateau-Renault, France, part interest to each

Filed Nov. 9, 1978, Ser. No. 959,169

Claims priority, application France, Nov. 15, 1977, 77 34214

Int. Cl.[3] G01G *23/22, 23/14, 1/18*

U.S. Cl. 177—41 **8 Claims**



1. Weighing instrument having a receiver tray for foodstuffs movable with respect to a body and an index mark displaceable along a predetermined path on a housing carried by said body in front of a first scale marked in weight and fixed with respect to said housing as well as in front of a plurality of second scales marked in at least one magnitude involved in dietetics and borne by a flexible strip on which they are succeeded by categories of foodstuffs, this magnitude being proportional to the weight of foods and the position of said flexible strip with respect to said housing being adjustable at will to operate selectively in association with the index mark that of its second scales which corresponds to the category of foodstuff to be weighed, the flexible strip being guided by a plurality of parallel rollers of which one at least is provided with control means enabling it to be rotated selectively to make the various second scales move in front of the index mark along a path substantially perpendicular to said predetermined path of said index mark, the housing including means for receiving selectively and removably, between said predetermined path of the index mark and the flexible strip, one card provided with third scales arranged to cooperate with said index mark and selected from a plurality of cards each corresponding to a particular foodstuff.

4,223,751

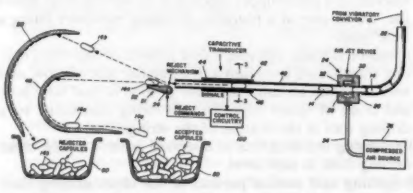
HIGH SPEED CAPACITANCE APPARATUS FOR CLASSIFYING PHARMACEUTICAL CAPSULES

Joseph W. Ayers, Roseville, and Rex C. Wood, New Brighton, both of Minn., assignors to Modern Controls, Inc., Elk River, Minn.

Filed Mar. 26, 1979, Ser. No. 24,071

Int. Cl.[2] G01G *3/14, 19/52;* **B07C** *5/344;* **H01G** *5/04*

U.S. Cl. 177—210 C **25 Claims**



1. Apparatus for checking the relative masses of a plurality of capsules or the like comprising a capacitance-sensing transducer including a pair of spaced capacitor plates, and pneu-

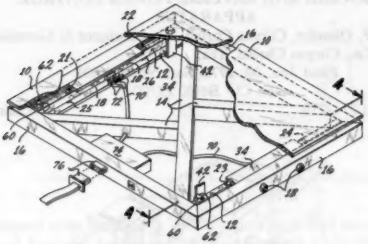
matic means for individually moving said capsules one at a time between said plates.

4,223,752

SCALE EMPLOYING WHEATSTONE-TYPE BRIDGES AND STRAIN GAGES

Claude A. Belcher, 4456 Arch St., San Diego, Calif. 92116

Filed Feb. 1, 1979, Ser. No. 8,401
Int. Cl.³ G01G *3/14, 21/24*
U.S. Cl. 177—211 **8 Claims**



7. A scale, comprising:

(a) a platform and means supporting said platform including load measuring means that includes strain gages,

(b) electrical bridge means of the type having four resistors, said strain gages being included in the resistors of said electrical bridge means, said bridge means having a voltage output signal responsive to load,

(c) said load measuring means including horizontally disposed torsion bars, and said torsion bars having said strain gages mounted thereon to measure strain in said torsion bars, and

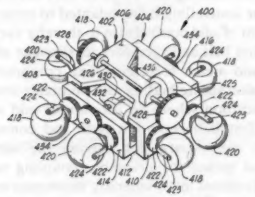
(d) said load measuring means including load transferring mountings associated with said torsion bars that are adjustable therealong in scale calibration.

4,223,753

OMNI-DIRECTIONAL TRANSPORT DEVICE

Harold M. Bradbury, 1001 Ten St., Woodward, Okla. 73801

Filed Dec. 19, 1977, Ser. No. 862,032
Int. Cl.² B62D *11/00, 57/00, 61/06*
U.S. Cl. 180—6.2 **9 Claims**



1. An omnidirectional transport device comprising:

a frame;

a first plurality of roller drive assemblies, rotatingly mounted upon the frame;

a second plurality of roller drive assemblies, rotatingly mounted upon the frame and positioned to rotate about axes non-parallel to the axes of rotation of the first plurality of roller drive assemblies; and

wherein each of said roller drive assemblies comprises:

a yoke, rotatably mounted upon the transport device; and

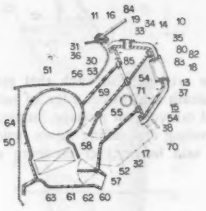
a spherical roller, rotatably mounted within the yoke upon axle means having an axis of rotation transverse to the axis of rotation of the yoke, said spherical roller defining two arcs of a circle about the axis of rotation of the yoke, so constructed that at least one roller of each plurality of roller assemblies is always in contact with a surface of which is to be traversed.

4,223,754

INSTRUMENT PANEL DEVICE FOR CARS

Hiroshi Mizuno, Higashi-Kurume, and Seiichiro Kobayashi, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1978, Ser. No. 891,723
Claims priority, application Japan, Apr. 1, 1977, 52-40415[U]
Int. Cl.² B60H *1/00*
U.S. Cl. 180—90 **4 Claims**



1. An instrument panel device for automobiles comprising:

an automobile instrument panel;

a closing plate having a partition plate formed substantially integrally therewith, said closing plate being provided on the rear side of said automobile instrument panel to form a closed space between the rear surface of said instrument panel and said closing plate, said instrument panel, said closing plate, and said closed space extending substantially over the entire width of the automobile;

said partition plate extending from said closing plate so as to substantially vertically section said closed space into first and second systems of air conduit passages, said first and second systems of air conduit passages being substantially separated from each other by said partition plate, and co-extending substantially over the entire width of the automobile;

ports disposed on the front surface of said instrument panel for blowing conditioned air into the interior of the automobile, said ports communicating with said first system of said air conduit passages;

defroster blowing ports disposed on the upper surface of said instrument panel for blowing conditioned air into the interior of the automobile, said defroster blowing ports communicating with said second system of said air conduit passages;

means for selectively distributing conditioned air to said passages; and

the top end of said partition plate provided on said closing plate being engaged with a groove provided on the opposing rear surface portion of said instrument panel.

4,223,755

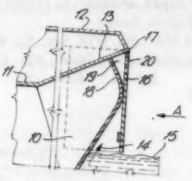
SUPPRESSING EJECTION OF WATER AND OTHER SURFACE MATERIAL FROM AIR CUSHION VEHICLES

Rowland D. Hunt, Calgary, Canada, assignor to Hoverlift Systems Ltd., Calgary, Canada

Filed Jul. 21, 1978, Ser. No. 926,933
Int. Cl.² B60V *1/16*
U.S. Cl. 180—123 **6 Claims**

1. Apparatus for suppressing ejection of water spray and the like from an air cushion vehicle, the vehicle comprising a hull structure and a flexible skirt attached to a lower surface of the hull structure, the flexible skirt having a downwardly and inwardly inclined portion for at least a lower part thereof and having a lower edge beneath which air can escape from a

cushion space beneath the hull structure, and a flexible barrier attached to the periphery of the hull structure outside said skirt and extending downwardly, said inclined portion of said skirt and said flexible barrier defining a convergent passage, a plurality of closely spaced apertures extending along an upper part of said flexible barrier, and ballast means at a lower part of



said barrier, the arrangement such that spray and the like issuing from beneath said lower edge of said flexible skirt is ejected into said convergent passage, impinging on said barrier, water separating and falling down inside said barrier to escape beneath said barrier, air escaping out through said apertures.

4,223,756

TRAFFIC SYSTEM WITH AUTOMATICALLY TRANSVERSELY CONTROLLABLE VEHICLES, ESPECIALLY FOR THE LOCAL PUBLIC PASSENGER TRAFFIC

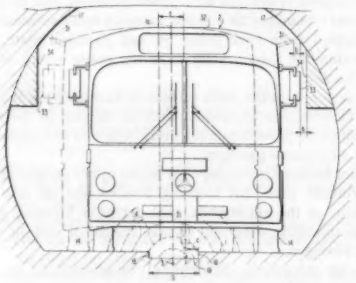
Helmut Bertelsbeck, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 8, 1978, Ser. No. 940,768

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1977, 2740576

Int. Cl.³ B62D *1/24*

U.S. Cl. 180—169 **21 Claims**



1. A traffic system, which comprises automatically, transversely controllable vehicles, track-determining guide means extending along a desired track on the road, and cross-positional control means on the vehicle which detect the course of the guide means and act on steerable wheels of the vehicle, characterized in that for purposes of catching a track-deviating vehicle, an emergency safety channel means delimited by substantially vertical lateral web means is arranged along the road between supporting wheels of the vehicle at least within the area of such road sections as are delimited at least on one side thereof by lateral boundary means, the width of said emergency safety channel means corresponding to the maximum permissive cross-positional tolerance of the vehicle on the road under avoidance of lateral collisions, in that at least one emergency safety bolt means normally taken along in the raised position and operable to be rapidly lowered under the effect of a storage means is arranged approximately centrally in the vehicle at the bottom side thereof, which is operable to support itself at the lateral web means, and in that feeler means are provided on the vehicle which extend on both sides beyond the driving profile of the vehicle and which are operatively connected with a triggering means for the storage means, said triggering means responding during an external collision of a feeler means and being operable to fire the bolt means into the emergency safety channel means by means of the storage means.

4,223,757

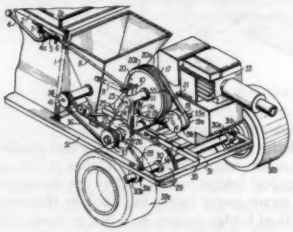
FORWARD AND REVERSE POWER CONTROL APPARATUS

Harvey F. Olander, Corpus Christi, Tex., assignor to Gustafson Mfg. Co., Corpus Christi, Tex.

Filed Jun. 30, 1978, Ser. No. 921,099

Int. Cl.² B60K *23/00*

U.S. Cl. 180—273 **19 Claims**



1. A power control apparatus for an engine comprising:
an engine having an output shaft;
a first pulley connected with said output shaft,
a second pulley,
a pivotable control arm upon which said second pulley is mounted, said pivotable control arm being arranged such that its pivotal movement causes a change in the distance between the axes of said first and second pulleys,
a first belt connected between said first and second pulleys for coupling rotative movement of said first pulley to said second pulley to thereby rotate said second pulley in a first direction, the tautness of said first belt being controlled by the position of said control arm, and
means for controlling the RPM of said second pulley, said means for controlling being adapted to control the pivotal movement of said control arm to thereby vary the tautness of said first belt and therefore its slippage about said first pulley, said means for controlling comprising a tension-compression spring biasing said pivotable control arm to a neutral position where no rotation of said second pulley by said first belt occurs, a push rod connected to said pivotable control arm for moving the same, a control lever, and means for pivotably coupling said push rod with said control lever whereby movement of said control lever controls the movement of the pivotable control arm.

4,223,758

LOADER, ESPECIALLY BUCKET LOADER FOR UNDERGROUND MINING

Jörg Schopf, Stuttgart, Fed. Rep. of Germany, assignor to Schopf Maschinebau GmbH, Stuttgart, Fed. Rep. of Germany

Filed May 2, 1978, Ser. No. 902,079

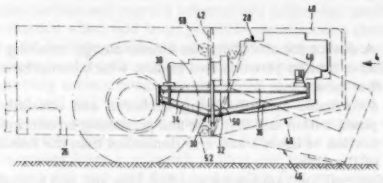
Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2815019

Int. Cl.² B60K *9/00*

U.S. Cl. 180—291 **12 Claims**

1. A loader, especially a bucket loader for underground use in mining operations, comprising a rear car carrying a propulsion unit including a hydraulic pump, a driver's station and

having a rear axle, a front car, a hinge joint coupling the front car to the rear car, said front car carrying a bucket and a hydraulic system for operating said bucket, a motor and transmission assembly, said rear car being formed by a chassis stiffly joined to said rear axle, said chassis having a first bulkhead for mounting the motor and transmission assembly thereon, said first bulkhead being disposed behind said rear axle and having a cutout provided approximately centrally in said first bulkhead and open at the top, so that said first bulkhead is approximately U-shaped, said motor and transmission assembly being disposed on a secondary frame which has a second bulkhead



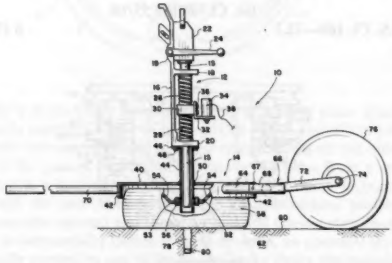
adapted to be fastened to said first bulkhead, said second bulkhead having a U-shaped configuration with a cutout open at the top, longitudinal girders projecting from said second bulkhead from within said cutout of said first bulkhead on both sides of said motor and transmission assembly forwardly and rearwardly in the longitudinal direction of said loader, said motor and transmission assembly being mounted between said girders, and a sturdy bottom trough covering that portion of said secondary frame which extends rearwardly beyond said second bulkhead and said motor and transmission assembly carried thereby, said bottom trough being releasably fastened to said first bulkhead.

4,223,759

LOW ENERGY SOURCE FOR SEISMIC OPERATION

Philip N. Martin, Tulsa, Okla., assignor to Mapco, Inc., Tulsa, Okla.

Filed Nov. 27, 1978, Ser. No. 963,982
Int. Cl.³ G01V *1/10*
U.S. Cl. 181—116 **14 Claims**



1. A lightweight, mobile, low-energy seismic source, comprising;

(a) a gun, comprising a barrel and a breech, adapted to hold a shell having a propellant and a solid projectile, and means to fire said shell;

(b) base means to support said gun in a substantially vertical position slightly above the surface of the earth, the base comprising;

(1) an annular means adapted to rest on the earth,

(2) horizontal plate means supported coaxially above said annular means and having and opening therethrough;

(3) means to support said gun vertically, with its barrel over said plate means opening, and the muzzle of said barrel being positioned a selected distance above the surface of the earth;

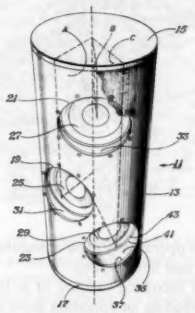
whereby when said shell is detonated, said projectile will be ejected at high velocity from said barrel, downwardly through said opening in said base, to strike and penetrate the surface of the earth to generate a seismic wave.

4,223,760

LOUDSPEAKER ASSEMBLY

Ted L. LeTourneau, P.O. Box 7655, Longview, Tex. 75602

Filed Apr. 24, 1978, Ser. No. 898,717
Int. Cl.³ H05K *5/00*
U.S. Cl. 181—147 **8 Claims**



1. A loudspeaker assembly comprising:

a. at least three speakers, each being substantially the same size and having a peripheral front surface;

b. a housing having a cylindrical body and end closures:

c. said cylindrical body having at least three vertically spaced openings therein, with each said opening sized and shaped to correspond with the peripheral outline of a respective said speaker, with the central axis of a first said opening being contained in a first radial plane, with the central axis of a second said opening being contained in a second radial plane, with the central axis of a third said opening being contained in a third radial plane, and with the angle between adjacent said radial planes being less than the angle between two radial planes that are respectively tangent to the peripheral edges of a said opening;

d. a respective filler element surrounding the periphery of each said opening and extending inwardly therefrom and having a front face contoured to contiguously abut said body and a planar rear face;

e. means mounting and securing each speaker with its peripheral front surface abutting the planar rear face of a respective filler element;

f. said cylindrical body, end closures and filler elements being made of material that is impervious to air.

4,223,761

APPARATUS FOR DESCENDING A ROPE

Walter Sonnberger, Dietmannsdorf 13, A 8181 St. Ruprecht, Raab, Austria

Filed Feb. 6, 1979, Ser. No. 9,798
Int. Cl.² A62B *1/14*
U.S. Cl. 182—5 **10 Claims**

1. An apparatus for descending a vertical strand, said apparatus comprising:

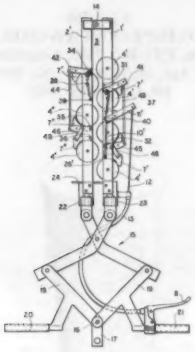
a pair of laterally spaced housing parts adapted to flank said strand;

an upper pivot forming an upper pivot axis between said housing parts;

respective pluralities of rollers on said housing parts engageable with a strand between said housing parts;

a scissor linkage having at least two pivoted-together cross-

ing links and having a pair of upper ends and a pair of lower ends, whereby on movement of said lower ends toward and away from each other said upper ends synchronously also move toward and away from each other; means connecting said upper ends of said linkage each to a respective housing part below said pivot axis;



a pair of handles operatively each connected to a respective lower end of said linkage; and

brake means for retarding rotation of at least some of said rollers and including an operating lever carried on one of said handles.

4,223,762

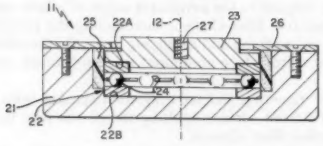
OMNIDIRECTIONAL VIBRATION ISOLATING

Maurice Gertal, 75 Massasoit St., Waltham, Mass. 02154

Filed Aug. 1, 1978, Ser. No. 929,926

Int. Cl.[3] F16F *7/00, 11/00*

U.S. Cl. 188—1 B **4 Claims**



1. In a vibration isolation system having means for providing a high degree of vibration isolation along an axial direction greater than along a direction orthogonal to said axial direction the improvement comprising,

a floating member means for significantly increasing isolation from vibration along said orthogonal direction,

means for supporting said floating member means with high stiffness along said axial direction many times greater than the stiffness provided by said system along said axial direction,

and means for restraining movement of said floating member means along said orthogonal direction with very low stiffness of the order of that provided by said system along said axial direction,

said means for supporting comprising thrust bearings having hardened balls between flat surfaces of hardened races which flat surfaces are in planes orthogonal to said axial direction.

4,223,763

KINETIC ENERGY ABSORBER

Didier A. Duclos, Charenton, and Pierre F. Coutin, Paris, both of France, assignors to R. Alkan & Cie, France

Filed Dec. 6, 1978, Ser. No. 967,177

Claims priority, application France, Dec. 27, 1977, 77 39286

Int. Cl.[2] F16F *7/12*

U.S. Cl. 188—1 C **12 Claims**

1. A device for absorbing the kinetic energy resulting from a relative motion between two bodies, which comprises:

a first tube,

a deformable test-tube being anchored and coaxially disposed within said first tube and presenting an intermediate portion of lesser transverse dimension than the remainder of the tube,

a first ball-joint anchoring said first tube and said test-tube to one of said bodies,

a second tube,

a pressure member co-acting with said test-tube housed within and connected to said second tube which is adapted to move telescopically in relation to said first tube and which is anchored to the other of said bodies through a second ball-joint, said pressure member comprising at least one pair of parallel rollers mounted on a carriage, said rollers being spaced from one another a distance equal to the lesser transverse dimension of the test tube and normally contacting said intermediate portion of the test-tube, whereby relative telescoping movements of the first and second tubes will move said carriage and rollers relative to said test-tube to cause deformation of the test-tube moving between said rollers in portions adjacent to said intermediate portion thereof.

4,223,764

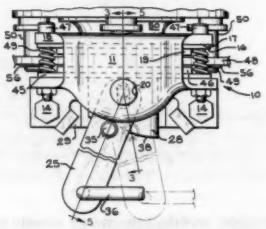
DISK BRAKE ASSEMBLY

Richard A. Flotow, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

Filed Feb. 13, 1978, Ser. No. 876,983

Int. Cl.[2] F16D *55/08*

U.S. Cl. 188—72.7 **6 Claims**



1. A brake assembly for vehicles having a housed axle, said brake assembly including: an axially and rotationally movable disk concentrically mounted such that said disk revolves with the axle; a fixed brake plate and a movable brake plate opposingly mounted parallel to and on opposite sides of said disk and to the axle housing; releasable means for gradually moving said movable brake plate and said disk toward said fixed brake plate thereby pressing said disk between said brake plates and hindering rotational movement of said disk; said releasable means including a sliding actuating member and an adjacent releasable operating lever; guide means for said sliding actuating

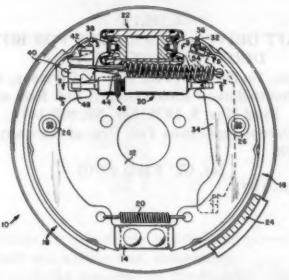
member, said guide means defining a center-line path perpendicular to said disk; said sliding actuating member having a pressing surface contiguous with said movable brake plate, an elongated center-line slot therethrough for insertion of a fixed pivot pin and for maintaining said actuating member in sliding engagement with said fixed pivot pin, and a cam surface on said actuating member opposed to said pressing surface, said cam surface being obliquely oriented relative to said pressing surface and gradually projecting away relative to said pressing surface; said operating lever being pivotally connected at one end to said fixed pivot pin and having a cylindrical pin cam follower displaced from said one end and rotationally movable about said fixed pivot pin, whereby said cam follower engages said cam surface and exerts a substantially center-line pushing force thereon when said lever pivots in one direction thereby progressively sliding said actuating member along such center-line perpendicular path relative to said fixed pivot pin such that said pressing surface progressively moves said movable brake plate and said disk toward said fixed brake plate; at least one return spring between said brake plates for retracting said movable brake plate away from said fixed brake plate when said operating lever is released; at least one return spring between said disk and said fixed brake plate for retracting said disk away from said fixed brake plate when said operating lever is released.

4,223,765

DRUM BRAKE HAVING PAWL AND LEVER

John L. Turak, South Bend, Ind., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sep. 28, 1978, Ser. No. 946,482
Int. Cl.[3] F16D *65/38*
U.S. Cl. 188—79.5 P **7 Claims**



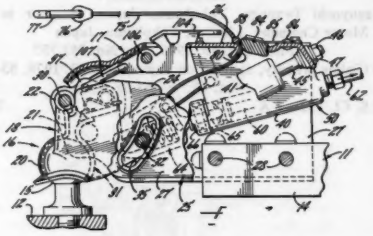
1. In a drum brake assembly having a backing plate which pivotally supports a pair of brake shoes at one end of the pair of brake shoes, a hydraulic actuator engageable with the other end of the pair of brake shoes to move the same from a rest position to a braking position, an extendible member engageable with the pair of brake shoes at an intermediate position between the one end and the other end and cooperating therewith to substantially define the rest position, an operator lever pivotally carried by one of the pair of brake shoes, the operator lever being pivotal relative to the one brake shoe to cooperate with the extendible member and move the pair of brake shoes to the braking position, a pawl pivotally carried by the other brake shoe and cooperating with the extendible member to adjust the rest position of the pair of brake shoes when the distance between the rest position and the braking position is above a predetermined dimension, the improvement wherein the pair of brake shoes are reversible so that the one brake shoe can be used in place of the other brake shoe, the pair of brake shoes including openings which are located between the intermediate portion and the other end, said opening on the one brake shoe cooperating with the operator lever to pivotally mount the same relative to the one brake shoe and said opening on the other brake shoe cooperating with the pawl to pivotally mount the same relative to the other brake shoe, and said openings being mirror images of each other.

4,223,766

TRAILER HITCH AND BRAKE ACTUATING ASSEMBLY

Larry C. Huetsch, Rockford; James P. Swanson, Winnebago, and Stephen E. Nyquist, Cherry Valley, all of Ill., assignors to Atwood Vacuum Machine Company, Rockford, Ill.

Filed May 30, 1978, Ser. No. 910,100
Int. Cl.[2] B60T *7/20*
U.S. Cl. 188—112 R **7 Claims**



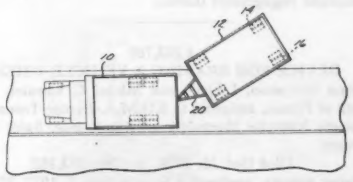
1. An assembly for hitching a trailer to a towing vehicle and for automatically actuating the hydraulic brakes of the trailer when the latter overruns the towing vehicle, said assembly comprising a forward unit adapted to be coupled removably to the towing vehicle, a rear unit interconnected with and movable generally fore-and-aft relative to said forward unit and adapted to be carried on the trailer, a master cylinder carried by said rear unit and operable when actuated to apply the brakes of the trailer, a plunger having a rear end portion telescoped into said master cylinder and operable to actuate said master cylinder when moved to a braking position, a plate on the forward end portion of said plunger and having a generally T-shaped opening formed therethrough with the cross bar and the stem of the T defining a rearward cage and a forward slot, respectively, a coil spring compressed between the front and rear sides of said cage, a laterally extending rod carried by said forward unit and received within said slot, said rod engaging the forward end of said spring and acting through said spring to move said plunger to said braking position when said rear unit moves forwardly relative to said forward unit.

4,223,767

ANTI-JACKKNIFING METHOD AND APPARATUS

P. Ray Powell, 4622 Lincoln Blvd.,, Cypress, Calif. 90630

Filed Jan. 22, 1979, Ser. No. 5,148
Int. Cl.[3] B60T *7/08*
U.S. Cl. 188—112 A **10 Claims**



1. Anti-jackknifing apparatus for a trailer towed by a tow vehicle, said trailer including left and right rear wheels and left and right brake means operative to brake said left and right wheels, respectively, said apparatus comprising:

disabling means coupled to one of said left and right brake means and actuable for rendering only one of said left and right brake means inoperative whereby braking of said

trailer by the driver of said tow vehicle is ineffective to brake the wheel or wheels associated with said one of said left and right brake means; and,

control means manually operative in the tow vehicle to actuate said disabling means for an extended period of time whereby said disabling means is adapted to render said one of said left and right brake means continuously inoperative during travel of said trailer over slippery roads.

4,223,768

PARKING MECHANISM IN AUTOMATIC TRANSMISSION

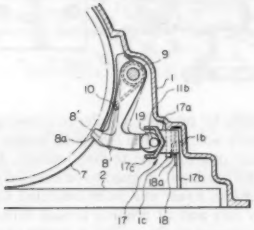
Kazuyoshi Iwanaga, Yokohama, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 19, 1978, Ser. No. 952,757

Claims priority, application Japan, Sep. 13, 1978, 53-112644

Int. Cl.³ F16D *67/00*

U.S. Cl. 192—4 A **7 Claims**



1. In a parking mechanism of an automatic transmission for a motor vehicle, the parking mechanism having a park gear fixed relative to an output shaft of the automatic transmission for rotation therewith, a parking pawl which is pivotally mounted for movement between an inoperative position spaced from the park gear and an operative position in mesh with the park gear when park position of the automatic transmission is selected, an actuator support fixed in relation to the transmission case, an actuator rod longitudinally movably supported by the actuator support and a cam mounted on the actuator rod, the cam being positioned to urge said parking pawl from said inoperative position to said operative position when the park position of the automatic transmission is selected, the improvement comprising said actuator support being a one-piece member formed by press-forming a sheet metal blank and having a support portion which is shaped to support said actuator rod and to receive said cam, and two anchor portions which have end portions arranged relative to said support portion so as to be spaced from said actuator rod and said cam, said transmission case being formed with two slits located and shaped to receive said two anchor portions in interlocked engagement therein.

4,223,769

DEVICE FOR BRAKING A VEHICLE WHEEL

Georges Servanton, L'Etrat, and Michel C. Garnier, Brunoy, both of France, assignors to S.O.M.A.-Europe Transmissions Societe Nouvelle Mecanique et Automobile, Saint Etienne, France

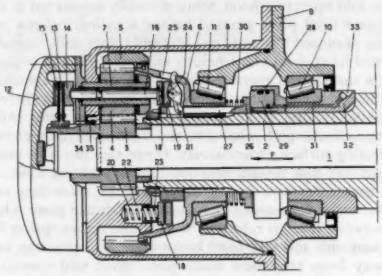
Filed Oct. 20, 1978, Ser. No. 953,102

Claims priority, application France, Nov. 7, 1977, 77 33467

Int. Cl.³ F16D *55/26;* B60K *41/26*

U.S. Cl. 192—4 A **6 Claims**

1. A device for braking a vehicle wheel whose hub is rotatably mounted on a stub axle of a rear axle of the vehicle and which is rotated through a drive shaft emerging at the free end of the stub axle, and on which is fixed the sun wheel of an epicyclic train reducer whose planet wheels, engaged with a ring gear integral with a ring gear carrier fixed on the stub axle, are mounted on shafts carried by the bottom of a casing integral with the hub and enclosing the reducer, this device being fixed on the outer face of the bottom of the casing and comprising a watertight case enclosing at least one friction disc interlocked in rotation with the drive shaft, as well as an annular plate axially movable under the action of control means for applying it against the disc, characterized in that the control



means comprise push-rods housed in the shafts carrying the planet wheels, these rods bearing on the annular plate with one of their ends and being connected at their other end by a ring disposed inside the ring gear carrier, a non-rotatable counter-plate adapted to be applied against the ring for pushing it, against resilient return members, towards the friction disc, rocking levers for moving the counter-plate and means for actuating the rocking levers.

4,223,770

SHAFT DRIVE ALTERNATELY FOR BOTH DIRECTIONS OF ROTATION

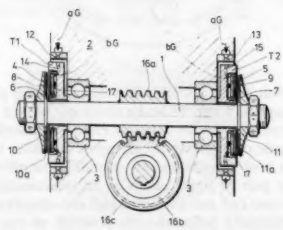
Walter Kranz, Taufkirchen, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,143

Claims priority, application Fed. Rep. of Germany, Nov. 29, 1977, 2753106

Int. Cl.² F16D *47/06*

U.S. Cl. 192—0.07 **8 Claims**



1. A shaft drive, comprising, bearing means, an output shaft rotatably supported on said bearing means, first and second turbines comprising respective first and second turbine wheels freely rotatable on said output shaft for rotation in respective opposite first and second directions, means to direct fluid to said first and second turbine wheels selectively and alternatively to rotate said wheels in respective first and second opposite directions, first clutch means connected to said shaft and being connectable with said first turbine wheel to drive said output shaft in said first direction of rotation, second clutch means connected to said output shaft and being connectable with said second turbine wheel to drive said output shaft in a second direction of rotation, said means to direct fluid to re-

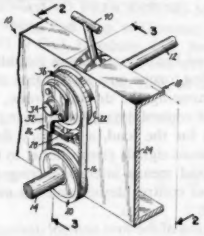
spective ones of said first and second turbine wheels being effective to engage respective first and second clutch means with said respective first and second turbine wheels, said first and second clutch means being disengaged when said means to direct fluid to said turbine is stopped.

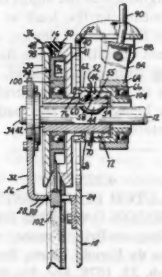
4,223,771

BRAKE CLUTCH

Walter J. Petersen, Eden Prairie, Minn., assignor to The Toro Company, Minneapolis, Minn.

Filed Jun. 30, 1978, Ser. No. 921,059
Int. Cl.[2] F16D *13/76, 67/00*
U.S. Cl. 192—10 **11 Claims**





1. Apparatus for selectively transmitting power between a rotating shaft and a drive belt, comprising:

(a) a drive pulley mounted to the shaft for rotation therewith, said drive pulley having a belt engaging surface about the outer periphery thereof;

(b) a brake member mounted about the shaft and affixed against rotation therewith, said brake member having a frictional braking surface thereon; and

(c) means for selectively positioning the drive belt on said belt drive surface or said frictional braking surface to engage or disengage, respectively, the drive belt from the rotating shaft.

4,223,772

SEMI-AUTOMATIC ROLLER LOCKING CLUTCH

Thomas M. Telford, Gladstone, Oreg., assignor to Warn Industries, Inc., Kent, Wash.

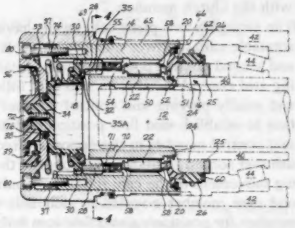
Filed Sep. 11, 1978, Ser. No. 940,963
Int. Cl.[2] F16D *41/04*
U.S. Cl. 192—48.6 **9 Claims**

1. In a semi-automatic roller type locking clutch for use between rotational, concentric driving and driven members, with one of said members having a plurality of axially extending grooves therein opening radially outwardly toward said other member with each of said grooves having a roller disposed therein, and the other member having a plurality of axially extending grooves therein opening radially inwardly toward said other grooves, said clutch comprising:

(a) torque responsive means moving each of said rollers radially out of its groove up onto one edge thereof and into contact with one edge of each groove disposed within said driven member whenever said driving member rotates faster than said driven member;

(b) a clutch ring axially slidable along and in splined engagement with one of said members, said clutch ring being urgeable into a simultaneous splined engagement with the other of said members; and

(c) a dial member having a dial screw extending within and spaced apart from said clutch ring;



(d) a clutch cup abutting said clutch ring and disposed around and in spaced apart relation from said dial screw, said clutch cup being axially slidable along one of said members;

(e) a clutch nut abutting said clutch ring and in threaded engagement with said dial screw, said clutch nut being slidably engaged to said clutch ring and movable axially along said dial screw apart from said clutch nut as said dial member is rotated and said clutch ring is not urged into a simultaneous splined engagement with said other member; and

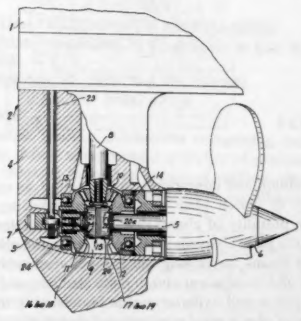
(f) means urging said clutch cup into said clutch ring and said clutch ring into a simultaneous splined engagement with said members when said members are nonrotational and said dial member is rotated.

4,223,773

DRIVE ENGAGING APPARATUS

Elmer E. Croisant, and Kass W. Sawyer, both of Oshkosh, Wis., assignors to Brunswick Corporation, Skokie, Ill.

Filed Sep. 12, 1977, Ser. No. 832,196
Int. Cl.[2] F16D *21/04, 23/12*
U.S. Cl. 192—48.91 **16 Claims**



1. A clutch apparatus comprising

(a) a housing

(b) an output shaft rotatably mounted in said housing,

(c) a drive member positioned in said housing coaxial with said output shaft,

(d) a clutch member rotatably fixed on said output shaft and moveable axially into drive engagement with said drive member and,

(e) shift means for positively moving the clutch member on said output shaft between a first position with said clutch member disengaged from said drive member and a second position with said clutch member engaged with said drive member, said shift means for positively moving the clutch member including control means directly connected to said clutch member and including:

(A) a rotatable control member movable axially of the output shaft and coupled to the clutch member to rotate with the clutch member;

(B) an engaging two-piece cam means having a first non-rotatable cam follower member movable between first and second control positions, means rotatably connecting said control member to said cam follower member and axially moving said control member in one direction to establish said first position and axially moving said control member in the opposite direction to establish said second position in response to the corresponding movement of the cam follower member, and a second cam member coupled to said first cam follower member for positioning said first cam follower member between said first and second control positions.

4,223,774

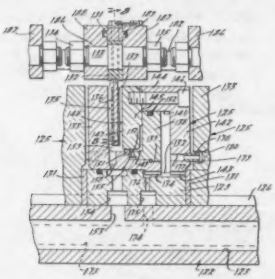
CLUTCH UNIT

Gordon M. Sommer, Grosse Pointe Farms, Mich., assignor to G. M. Sommer Company, Inc., Warren, Mich.

Filed Nov. 9, 1977, Ser. No. 849,858

Int. Cl.[2] F16D *25/063, 13/68, 13/72*

U.S. Cl. 192—85 AA **14 Claims**



1. A clutch unit comprising an input shaft, an output shaft, a plurality of clutch plate elements connected to one of said shafts, a plurality of clutch disc elements interleaved betwen said clutch plate elements and connected to the other shaft, and separate means for closing the gap between each clutch disc element and its adjacent clutch plate element, said means comprising piston and cylinder means associated with one of said plurality of clutch plate elements and clutch disc elements, and fluid pressure control means for simultaneously supplying pressurized fluid in parallel to all of said piston and cylinder means.

4,223,775

DRIVING AND BRAKING APPARATUS

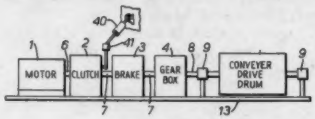
John Lloyd, Powick, England, assignor to Dowty Meco Limited, Worcester, England

Filed Mar. 10, 1978, Ser. No. 885,110

Claims priority, application United Kingdom, Mar. 12, 1977, 10554/77

Int. Cl.[2] F16D *67/06;* **B60K** *41/28*

U.S. Cl. 192—0.094 **7 Claims**



1. A driving and braking apparatus including motor means for exerting driving torque on a load, a first control device for starting and terminating the driving torque, brake means for the load, a second control device for applying and disengaging the brake means for the load, a memory device adapted to receive instantaneous signals proportional to the torque fed to drive the load, and means interconnecting the first control device, the second control device and the memory device in such manner that:

(a) upon operation of the first control device to terminate the driving torque fed to the load, the second control device operates to apply the brake means and the memory device registers the magnitude of the signal of driving torque fed by the motor means to the load at the instant of such operation of the first control device, and,

(b) upon subsequent operation of the first control device to start the driving torque to the load, the second control device operates to disengage the brake means when the signal of torque being fed to the load at least attains the magnitude registered in the memory.

4,223,776

FRICTION CLUTCH PLATE ASSEMBLY WITH TORSION DAMPING HUB

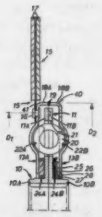
Jacques Berlioux, Sucy-en-Brie, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

Filed Feb. 23, 1978, Ser. No. 880,704

Claims priority, application France, Feb. 25, 1977, 77 05529; Dec. 13, 1977, 77 37511

Int. Cl.[2] F16D *3/14*

U.S. Cl. 192—106.2 **29 Claims**



1. In a clutch disc assembly comprising two coaxial elements angularly displaceable relative to each other against the action of elastic means operatively interposed between said elements, a first of said coaxial elements comprising a hub and a second of said coaxial elements comprising first and second generally axially spaced washers, an axial extension from at least one of said washers joining said one washer to the other of said washers and defining a continuous axial flange at the periphery of said one washer, said first washer carrying a friction disc, the improvement comprising means for fastening said friction disc

to said first washer disposed within the circumference of said axial flange and said friction disc freely extending radially outwardly beyond said axial flange.

4,223,777

METHOD AND APPARATUS FOR TRANSPORTING STACKS OF PAPER SHEETS OR THE LIKE BETWEEN PRODUCING AND PROCESSING MACHINES

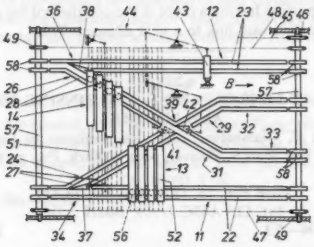
Kurt Aykut, Hamburg, Fed. Rep. of Germany, assignor to E. C. H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Feb. 8, 1978, Ser. No. 877,828

Claims priority, application Fed. Rep. of Germany, Feb. 25, 1977, 2708131

Int. Cl.[2] B65G *47/68*

U.S. Cl. 198—365 **12 Claims**



1. Apparatus for transporting sheets, especially stacks of paper sheets, from a station which receives rows of aligned sheets to a plurality of processing machines including a first and a second machine, comprising elongated first and second main tracks for transport of sheets toward the respective machines; first and second sets of successive reentrant conveyors; drive means including means for respectively moving the conveyors of said first and second sets along the associated tracks in directions toward the respective machines, for maintaining the conveyors of each set in spaced-apart positions so that the neighboring conveyors of each set define gaps and for maintaining the conveyors of said first set in register with the gaps between the conveyors of said second set; additional conveyor means for transporting the sheets of successive rows from said station to successive conveyors of said first and second sets; a first connecting track extending from said first main track toward said second main track so as to enable successive conveyors of said first set to move in their entirety into the gaps between the conveyors of said second set and to thereby move the respective sheets into exact register with the sheets on the conveyors of said second set; a second connecting track extending from said second main track toward said first main track so as to enable successive conveyors of said second set to transfer sheets into the gaps between the conveyors of said first set and into exact register with the sheets on the conveyors of said first set, said connecting tracks crossing each other, each of said tracks comprising at least one guide rail and said first and second connecting tracks including portions which are substantially parallel to said main tracks, said portion of said first connecting track being adjacent to said second main track and said portion of said second connecting track being adjacent to said first main track; and first and second junctions between said first and second main tracks and the respective connecting tracks.

4,223,778

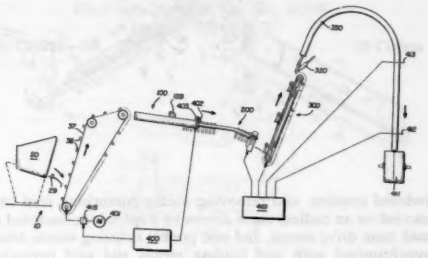
PARISON HANDLING ASSEMBLIES AND METHODS FOR HANDLING PARISONS

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed May 12, 1978, Ser. No. 905,315

Int. Cl.[2] B65G *43/00, 42/24, 47/04*

U.S. Cl. 198—389 **11 Claims**



1. A parison handling assembly for moving tubular, blowable parisons from a random bulk storage to the load station of a blow molding machine, said parison handling system comprising:

(a) a metering apparatus having means for feeding unoriented parisons from a random bulk storage container, at a controlled rate, to a discharge location;

(b) parison orienting means for receiving parisons from said discharge of said metering apparatus, said parison orienting means including means for orienting said parisons into a closely grouped arrangement of oriented parisons whereby said oriented parisons are side-by-side and upright, means for actuating said metering apparatus to feed parisons to said orienting means on demand;

(c) parison escapement means connected to said parison orienting means for releasing oriented parisons, means responsive to the number of parisons at the loading station for actuating said parison escapement means to release said oriented parisons;

(d) a parison transporter having means for receiving oriented parisons from said parison escapement means and for transporting said parisons into the opening of a feed tube, said feed tube being connected to the load station of the blow molding machine, whereby said parisons are pushed end-to-end through said feed tubes to the respective load stations of the blow molding machines.

4,223,779

AUTOMATIC TRANSFER MECHANISM

Ronald C. Hopkins, Amsterdam, N.Y., assignor to Life Savers, Inc., New York, N.Y.

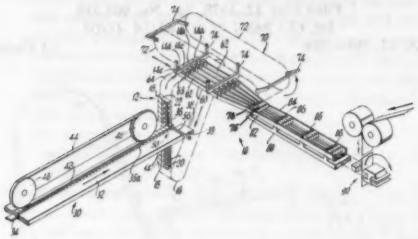
Filed Sep. 22, 1976, Ser. No. 725,202

Int. Cl.[3] B65G *47/26*

U.S. Cl. 198—426 **3 Claims**

1. An automatic transfer mechanism comprising transfer pocket indexing means comprising a plurality of pockets for collecting and indexing individual pieces of uniform size and pocket conveyor means to which said pockets are affixed, said pocket conveyor means being in the form of an endless chain, loading means comprising a reciprocating pusher bar actuated by an eccentric connected to a main drive means for automatically loading individual pieces into said pockets at a first position, pocket driving means which is in the form of a driven sprocket for moving said pocket conveyor means and said affixed pockets and the individual pieces contained therein to a second, indexed position 90° from their original first position about that axis of each piece which is transverse to direction of movement and parallel to plane of movement, said pocket driving means being connected to said main drive means

through an indexing drive providing a 180° dwell of said pocket driving means, and means for automatically removing the so-indexed and so-positioned pieces from said pockets in a manner such that the individual pieces are maintained in their



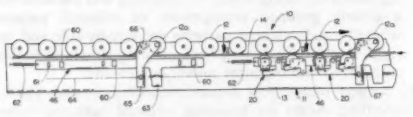
indexed position, said removing means comprising feed bars carried on an endless chain driven by a sprocket connected to said main drive means, and said pocket indexing means being synchronized with said loading means and said removing means.

4,223,780

ACCUMULATION CONVEYORS

Charles W. Saur, Sparta, Mich., assignor to Rapistan Incorporated, Grand Rapids, Mich.

Filed Sep. 1, 1978, Ser. No. 938,866
Int. Cl.[2] B65G *13/06*
U.S. Cl. 198—781 **31 Claims**



1. An actuator for an accumulator, said accumulator having a driven, strand-like propelling member and a frame and a plurality of carrier rollers collectively forming an article supporting and transporting surface, a plurality of cable support members beneath said cable, each of said members having a bracket, said actuator characterized in that each bracket has a cable supporting pulley at one end and a cable tracking element at the other end thereof, means supporting said bracket on said frame intermediate said pulley and tracking element for rocking motion in a plane common with the centerline of said propelling member; one of said carrier rollers being vertically aligned with said pulley; the end of said bracket mounting said pulley being biased away from said carrier roller; said element having a propelling member engaging surface, said surface being inclined to an axis generally normal to the axis of the propelling member; means for causing the point of contact between said propelling member and said surface to shift along said surface whereby to rock said bracket about its support means support and shift said pulley and the portion of the propelling member supported thereon between roller driving and roller release positions.

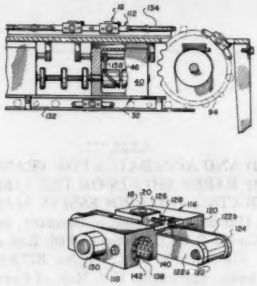
4,223,781

ENDLESS CONVEYOR CONSTRUCTION

Earl F. Beezer, Hillsdale, N.J., assignor to Stelron Cam Company, N.J.

Division of Ser. No. 820,833, Aug. 1, 1977, Pat. No. 4,166,527. This application Aug. 10, 1978, Ser. No. 932,604
Int. Cl.[2] B65G *17/12*
U.S. Cl. 198—793 **6 Claims**

6. A conveyor link construction comprising at least one block shaped member having a bore therethrough, linear roller bearing extending through said bore providing a rolling guide for a guide mmember, at least one roller projecting laterally from said block member on each side thereof for supporting



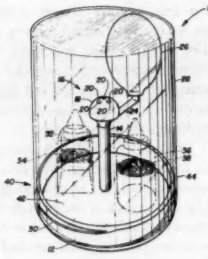
the sides of the block member on a guide, said block member having a forwardly and rearwardly extending link portion, each link portion having a pivot at the end thereof for pivotally interconnecting said link to a next adjacent link.

4,223,782

CONTACT LENS CLEANING AND RINSING DEVICE AND METHOD

Melcheore F. Giambalvo, York, Pa., assignor to George D. Weaver and Scott S. Weaver, both of York, Pa., part interest to each

Filed Feb. 23, 1979, Ser. No. 14,334
Int. Cl.[3] A45C *11/04*; B08H *3/04*
U.S. Cl. 206—5.1 **3 Claims**



1. A contact lens cleaning and rinsing device to retain a contact lens in securely held position for application of cleaning and rinsing solution materials thereto in an accomplishment of cleaning and rinsing maintenance functions to be performed thereupon, said device comprising in combination a vacuum head assembly adapted to receive and retain in close sealed temporary vacuum communication therewith said contact lens, said vacuum head assembly supportably disposed upon the upward terminal end of a vertically projecting vacuum head assembly support shaft affixed at the lower vertical end thereof centrally intermediate and on axial alignment of a supporting base member wherein said vacuum head assembly further comprises, a vacuum head contact support surface radially configured convexly upward to generally conform with a concave surface of said contact lens, a plurality of radially spaced vacuum port openings disposed circumferentially of said vacuum head contact support surface axially thereof and circumferentially therewithin and communicating from said surface downwardly to within an enclosed vacuum

manifold, said vacuum manifold in turn enclosably communicating to a vacuum respirator bulb by means of an enclosed vacuum respirator conduit interposed therebetween whereby upon an application of compressive pressure to said vacuum respirator bulb, thereby substantially evacuating the same, a differential vacuum pressure potential relative to an existing ambient pressure condition is thus created upon said vacuum head contact support surface through said communicating radially spaced vacuum port openings such that upon application of said contact lens by way of the concave surface thereof to said vacuum head contact support surface, and upon a release of said application of compressive pressure to said vacuum respirator bulb, said contact lens is temporarily sealed immobily upon said vacuum head contact support surface with the convex side of said contact lens thereby being openly disposed for said accomplishment of cleaning and rinsing maintenance functions to be performed thereupon, wherein said supporting base member is in the geometric form of a circular shape having an upwardly disposed base surface of uniform thickness throughout in which said upwardly disposed base surface is provided with a vertically upward extending side wall of a uniform elevation communicating therewith peripheral thereabout, said elevation being greater than that of said upwardly disposed base surface of uniform thickness but less than that of the upward terminal end of said vertically projecting vacuum head assembly support shaft to thereby provide a waste cleaning and rinsing solution collection reservoir.

4,223,783

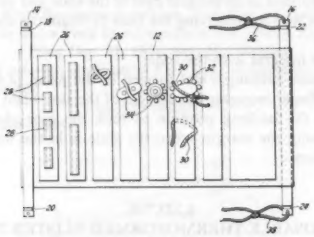
PACKAGING MEANS

Nickolas J. Marshall, P.O. Box 210, Lincoln Park, Mich. 48146

Continuation-in-part of Ser. No. 893,810, Apr. 26, 1978, abandoned. This application Apr. 26, 1979, Ser. No. 33,377

Int. Cl.³ B65D *5/50*

U.S. Cl. 206—45.14 **5 Claims**



1. The combination comprising:

a plurality of objects having pointed ends;

a generally rectangular sheet of resilient, compressible foam material having a thickness sufficient to embed the points of said pointed ends, and first and second end edges connecting a pair of side edges;

a plurality of closely spaced, parallel strips of tape, and an adhesive material on a first side of each of said tapes for fastening the tape to a first side of the sheet of foam material such that the adhesive is disposed between the tape and said sheet whereby the pointed ends of the pointed objects are each receivable through the tape and the adhesive material into the foam material so as to be anchored in position;

a first rod fastened along the first end edge of the sheet so as to extend beyond the side edges thereof;

a second rod fastened along the second end edge of the sheet, so as to extend beyond the side edges thereof, parallel to said first rod and to said strips of tape; and

a first string means connecting one end of the first rod to a corresponding end of the second rod, and second string means for connecting the opposite end of the first rod to the corresponding opposite end of the second rod such that said sheet can be rolled around the first rod in the manner of a scroll to enclose the tapes and said objects mounted on the first side of said sheet.

4,223,784

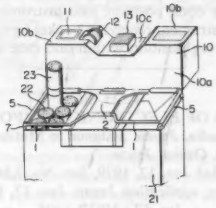
LIGHTER WITH CIGARETTE PACKAGE HOLDER PORTION

Masao Kaneyasu, Tokyo, Japan, assignor to Dentsu Central Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1979, Ser. No. 28,910

Int. Cl.³ F23Q *2/16*

U.S. Cl. 206—88 **10 Claims**



1. A combined lighter and cigarette package holder device comprising a base member contoured in a substantial tetragon shape, a lighter portion contoured in a substantial flat parallelopipedon shape and having one ridgeline hingingly attached to one side of one surface of the base member such that it can rotate between a first position where it is placed on the base member and a second position where it is placed perpendicularly with respect to the base member, spring means for urging the lighter portion towards the first position, at least one arm member hinged to each of the opposite sides of the base member which are perpendicular to the side thereof to which the lighter is hinged such that each of the arm members can rotate between a first position where it is placed adjacent the base member and a second position where it is placed perpendicularly to the base member, spring means for urging the arm members toward the first position, and the lighter portion including a gas ejection nozzle, a flint for igniting the gas ejected through the nozzle, an operation wheel for rotating a file in sliding contact with the flint and having at least a part projecting from a surface of the lighter portion, and a valve-opening button normally closing a valve for the nozzle and opening the valve when depressed.

4,223,785

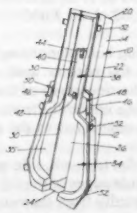
HAND HELD STRINGED INSTRUMENT CASE AND STAND

Jacques, 2233 Park Ave., Cincinnati, Ohio 45206

Filed May 31, 1979, Ser. No. 44,204

Int. Cl.³ A45C *11/00*

U.S. Cl. 206—314 **8 Claims**



1. A combination case and stand for a hand held stringed instrument, said case and stand having a body portion and a

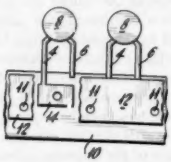
neck portion and two side, top and rear surfaces, the lower end of said case and stand providing a flat bottom supporting surface lying at an angle of about 90° with the long axis of said case and stand, said side, top, rear and bottom surfaces all having front edges defining a substantially rectangular opening, said case and stand having a pair of doors hingedly affixed along the front edges of said side surfaces which open and close upon themselves to define an instrument display position and an instrument carrying position, respectively, said doors in said closed position defining continuations of said side surfaces and a front surface and in said open position defining an instrument receiving pocket and forming a 90° angle with said bottom supporting surface so as to provide side to side stability when said doors are in the open position, whereby when said doors are in the open position, said instrument may be positioned in said instrument receiving pocket by orientation 90° to its normal carrying position within said case and stand.

4,223,786

SERIES OF ELECTRONIC COMPONENTS

Yoshio Hori, Osaka, Japan, assignor to Matsuo Electric Company, Limited, Osaka, Japan

Filed Jan. 12, 1979, Ser. No. 2,861
Claims priority, application Japan, Jan. 17, 1978, 53/4001
Int. Cl.³ H02B *1/04*
U.S. Cl. 206—330 **1 Claim**



1. A strip of electronic components comprising a plurality of components each having a pair of lead conductors projecting substantially in parallel relationship to each other from said component and in the same direction, the free ends of said lead conductors being positioned and secured between a pair of web-like strips of material and spaced successively at predetermined intervals, and at least one of said lead conductors of each component having an integral flat portion at the free end, said flat portion having a greater width as compared with the rest of said lead conductor and formed integrally with said lead conductor whereby said strips will securely retain said components in said predetermined spaced positions and orientation relative to said strips.

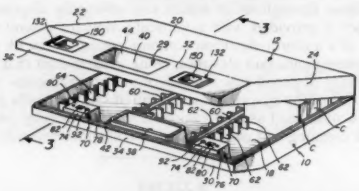
4,223,787

CASSETTE CARRYING CASE

Alan B. Lowry, Canton, Mass.; David E. Roche, Nashua, N.H., and Gregory Mathus, Concord, Mass., assignors to Data Packaging Corporation, Cambridge, Mass.

Filed May 9, 1979, Ser. No. 37,488
Int. Cl.³ G11B *23/02, 1/00;* **E05C** *1/10;* **B65D** *85/672*
U.S. Cl. 206—387 **8 Claims**

1. A cassette carrying case comprising a base and a cover,
said base having a flat bottom wall, side walls extending upwardly from the side edges of the bottom wall, and a rear wall extending upwardly from the rear edge of the bottom wall and connected to the rear ends of the side walls,
said cover having a flat top wall, side walls extending downwardly from the side edges of the top wall, and a rear wall extending downwardly from the rear edge of the top wall and connected to the rear ends of the side walls,
a handle portion formed as an integral part of the base and cover,
said handle portion having converging panels forming continuations of the bottom wall of the base and the top wall of the cover with the panels converging toward one another in a direction away from rear wall and toward the front of the case, front walls secured to the front edges of the panels and the front ends of the side walls of the cover and base, and aligned openings formed in both panels of the handle portion defining a finger grip opening for carrying the case,
a hinge secured to the rear walls of the cover and base enabling the cover and base to pivot 180° with respect to one another between a closed position wherein the front, side and rear walls engage one another and an open position wherein the top and bottom walls are substantiallly coplanar,
dividers mounted in the base defining a plurality of compartments for holding the cassettes, and



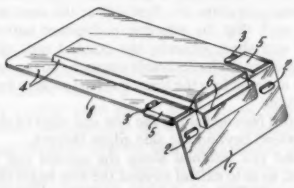
latching means provided in the handle portion of the cover and base to lock the case closed,
said latching means comprising at least one generally rectangular well formed in the panel of the cover,
a slide mounted in the well and movable between latching and unlatching positions,
a barb formed as an integral part of the slide and an opening in the well for receiving the barb to retain the slide in the well,
a finger integral with the slide,
and means defining a slot formed in the panel of the base, said finger engaging the margin of the slot when the slide is in the latching position to lock the case closed and releasing the margin when the slide is in the unlatching position.

4,223,788

RECLOSABLE THERMOFORMED BLISTER-TYPE PACKAGE

Arthur Jaeger, West Chester; Richard Gunderlock, Lederach, and Richard J. Harwood, Philadelphia, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Nov. 16, 1978, Ser. No. 961,429
Int. Cl.³ B65D *37/00, 55/00*
U.S. Cl. 206—468 **1 Claim**



1. A blister package adapted for opening along a predetermined line and reclosing with a positive closure device comprising:
a substantially rectangular sheet of rigid plastic having a

raised rigid thermoformed hollow plastic body portion having opposed top and bottom and lateral edges;

a score line intermediate the top and bottom edges parallel thereto and extending from side to side across said rectangular sheet;

a flexible plastic sheet sealed to said rectangular sheet thereby forming an enclosed hollow body portion adapted for storage of a small object protected from the atmosphere;

said score line spaced intermediate the top and bottom across the top end of said raised plastic body thereby providing a predetermined break line for access to package contents on bending back the top end;

a slide closure consisting of a rigid band of plastic extending from side to side across the back of said package and formed around the sides of said package so that substantial bending of said package is prevented by said slide;

a pair of raised ribs spaced along the edges of said rectangular sheet spaced parallel to and between said score line and said top edge;

said pair of raised ribs acting as slide stops and spaced to allow slide to be positioned over score line when advanced towards top edge of said package;

a second pair of raised ribs spaced along the edges of said rectangular sheet spaced to and between said score line and said bottom edge; and

said second pair of raised ribs acting as slide stops and spaced to allow slide to be slid clear of said score line, thus allowing bending back of said package and permitting access to the contents thereof.

4,223,789

OPENING MEANS FOR A PACKAGING MEANS OF FLEXIBLE MATERIAL

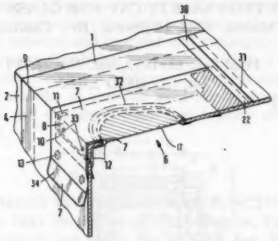
Wilhelm Reil, Bensheim-Auerbach, Fed. Rep. of Germany, assignor to Tetra Pack Developpement S.A., Pully, Switzerland

Filed Dec. 21, 1978, Ser. No. 972,049

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1977, 2758092

Int. Cl.[2] B65D 5/72

U.S. Cl. 206—605 **5 Claims**



1. In combination, an opening means, and a package made from flexible material, in particular for liquids, having an upper end wall, means defining a pouring opening in the upper end wall adjacent an edge line, and having an openable cover strip which is provided on the outside of the package, characterized in that an approximately U-shaped slot is provided in a side wall adjacent the edge line, to form a pouring edge which projects from the edge line and which can be pivoted forwardly into the plane of the upper end wall, wherein the pouring opening and the slot are provided with a plastics sealing means from the inside of the package, the free ends (11) of the U-shaped slot (10) are arranged to extend by a portion into the upper end wall (1), and the outer cover strip (7) is weld-free almost over the entire pouring edge region (8).

4,223,790

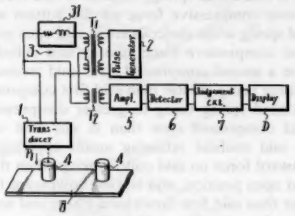
CONTAINER INSPECTION SYSTEM

Hajime Yoshida, Tokyo, Japan, assignor to Hajime Industries, Ltd., Tokyo, Japan

Filed Feb. 13, 1978, Ser. No. 877,280

Int. Cl.[2] B07C 5/34

U.S. Cl. 209—590 **10 Claims**



1. An object inspection system comprising:

(a) ultrasonic wave transmitting means positioned a substantial distance apart from an object to be inspected for generating an ultrasonic wave for a constant time period and impinging said ultrasonic wave on said object;

(b) means for receiving a modulated ultrasonic wave after the end of said time period modulated by said object at its inherent vibration frequency in response to the energy of said applied ultrasonic wave;

(c) means for producing an electrical signal corresponding to said modulated ultrasonic wave; and

(d) means for comparing said electrical signal with a reference signal to discriminate at least one property of said object.

4,223,791

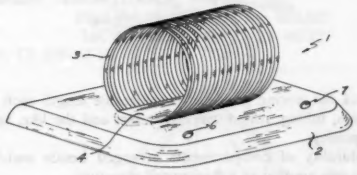
FISHING ROD HOLDER

John K. Taggart, Indianapolis, Ind., assignor to Plastilite Corporation, Omaha, Nebr.

Filed Sep. 15, 1978, Ser. No. 942,508

Int. Cl.[3] A47F 7/00

U.S. Cl. 211—120 **2 Claims**



1. A fishing rod holder, comprising

(a) a base member having a recess therein;

(b) a coiled spring mounted in said recess; and

(c) resilient means for retaining said coiled spring in said base member; said resilient retaining means biasing said coiled spring against said base member, said coiled spring having an uncompressed state, said recess having a lengthwise dimension which is less than the lengthwise dimension of said coiled spring in said uncompressed state; wherein said resilient retaining means retains said coiled spring in said recess, said coiled spring having a top side and a bottom side and having a plurality of coils, said coiled spring being compressed longitudinally along the bottom side to fit within said recess in a first compressed state, said recess having two ends, the bottom side of said coiled spring being held in said first compressed state by a first compres-

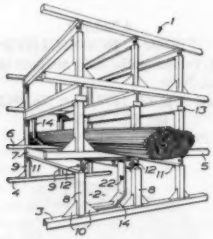
sive force exerted by the ends of said recess, said recess creating an aperture in said base, said resilient retaining means extending through said aperture and through said coiled spring, and exerting a first downward force against said coiled spring; the coils of said spring being pushed to an open position to hold a substantially cylindrical member, said open position giving rise to a normal restoring force in said coiled spring, the ends of said recess applying a second compressive force on the bottom side of said coiled spring when the coils are in said open position, said second compressive force causing said coiled spring to assume a second compressed state, said second compressive force being greater than said first compressive force, said coiled spring being in greater compression in said second compressed state than in said first compressed state, said resilient retaining means applying a second downward force on said coiled spring when the coils are in said open position, said second downward force being greater than said first downward force, said second compressive force together with said second downward force and said normal restoring force comprising a gripping force between the coils, said gripping force comprised of said forces increasing as the separation between the coils increases.

4,223,792

RACK FOR STORING GOODS OF CONSIDERABLE LENGTH

Kjell G. Aspén, Halmstad, Sweden, assignor to Acierex AB, Stockholm, Sweden

Filed Aug. 7, 1978, Ser. No. 931,592
Claims priority, application Sweden, Aug. 24, 1977, 7709506
Int. Cl.[2] A47F 5/00
U.S. Cl. 211—162 **8 Claims**



1. A rack for storing goods of considerable length such as battens, bars, tubing, rolled carpets, rollers and the like, said rack comprising:

(a) a plurality of compartments arranged beside and/or above one another in a framework structure,

(b) each compartment including longitudinal rails extending along the length of an upper section of each compartment,

(c) carriage means mounted in each compartment to move in a direction parallel to the longitudinal rails,

(d) said carriage means having a generally U-shape upwardly directed and essentially the same cross-sectional dimensions as the cross-section of the respective compartment,

(e) the carriage means including roller members located at the upper portions of the U-shape and being in rolling contact with the longitudinal rails,

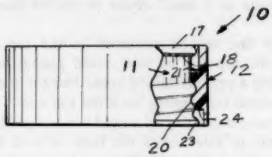
(f) the carriage means being movable between a forward position and a rearward storage position to carry the inner end of the goods while a portion of the goods at a location intermediate the ends thereof rests in a storage position directly on the framework structure at the forward end of the compartment when the carriage means is in a rearward storage position.

4,223,793

CHILD RESISTANT CLOSURE

John S. Patton, Baton Rouge, La., assignor to Ethyl Corporation, Baton Rouge, La.

Filed Apr. 30, 1979, Ser. No. 34,354
Int. Cl.[2] B65D 55/02
U.S. Cl. 215—220 **8 Claims**



1. A child resistant cap (10) comprising,

a cap member (11) and an outer ring (12),

said cap member having an internal thread (13) adapted to be received on a container (14),

an external thread (15) on the outer periphery of said cap,

said external thread extending upward along the lower part of said cap,

an outwardly directed flange (17) on the upper edge of said cap member (11),

the outer periphery of said cap between said flange (17) and said thread being a generally smooth cylindrical portion,

downwardly directed teeth (18) on said outwardly directed flange (17) on the side thereof adjacent said cylindrical portion,

an internally threaded portion on said ring terminating at its upper end in spaced teeth (22) on the upper edge (18) of said threaded portion,

said external threads on said cap terminating at the lower side in a second outwardly directed flange (23),

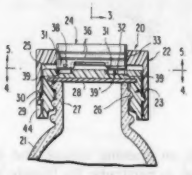
said ring (12) being adapted to be received on said cap with said internal threads engaging said external threads on said cap and engaging said second flange and said threads on said ring being adapted to receive said cylindrical portion of said cap.

4,223,794

PUSH BUTTON SAFETY CAP FOR GLASS BOTTLES

Glenn H. Morris, 4203 Highwood Dr., Chattanooga, Tenn. 37415

Filed Sep. 12, 1979, Ser. No. 74,780
Int. Cl.[3] B65D 55/02
U.S. Cl. 215—220 **10 Claims**



1. A safety cap assembly for containers comprising connected relatively rotatable outer and inner cap sections, the inner cap section being internally screw-threaded for engagement with container screw-threads, a push button operator carried by the outer cap section including depending drive tooth means adapted for engagement with cooperating drive means on the inner cap section when said operator is depressed following rotation of the outer cap section to align said tooth means with said drive means, said tooth means and said drive means having engageable cam surfaces whereby relative rotation of the outer and inner cap sections in one direction causes

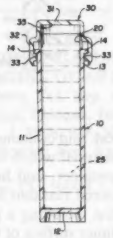
said cam surfaces to elevate said push button operator to a safe indicating position, and cooperative engageable final tightening drive elements on the outer and inner cap sections positioned thereon to move into engagement following elevation of the push button operator by the coaction of said cam surfaces.

4,223,795

CHILD-RESISTANT PACKAGE

Edward G. Akers, 647 Briarfield, Pecan Plantation, Granbury, Tex. 76048

Filed Apr. 9, 1979, Ser. No. 28,389
Int. Cl.[2] B65D *55/02*
U.S. Cl. 215—222 **16 Claims**



1. A fluid tight safety container and cap combination including: a container having a neck portion comprising a generally cylindrical annular wall; a cap having a base with a peripheral skirt projecting axially therefrom for receiving said neck; interengageable locking elements on the outer wall of said container neck and on the inner wall of said cap skirt; said container locking elements being spaced peripherally from each other; and said cap locking elements being engageable with and disengageable from said container locking elements through combined axial and rotative motion of said cap relative to said container; wherein the improvement comprises

an annular, flexible member formed on the distal end of said neck, as an axial extension thereof, and having an outer annular free end disposed in a plane perpendicular to said neck and said flexible member; said annular flexible member having a stiffness to prevent axial deformation thereof;

said cap having means providing an annular sloping surface disposed between said base and said locking elements; said cap sloping surface being engageable with said free end of said flexible member, to deflect said flexible member radially and thereby to exert an axial biasing force between said cap and container when said locking elements are engaged.

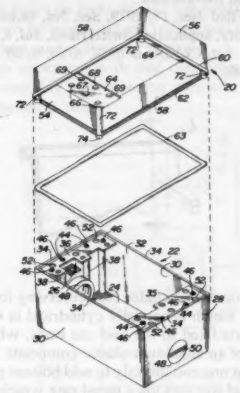
4,223,796

ATTACHMENT FOR ELECTRICAL JUNCTION BOX

Harry Silver, 1844 Meadowbrook Rd., Abington, Pa. 19001

Continuation-in-part of Ser. No. 873,188, Jan. 30, 1978, abandoned. This application Mar. 22, 1979, Ser. No. 23,048
Int. Cl.[2] H02G *3/08*
U.S. Cl. 220—3.8 **17 Claims**

1. An extender for an electrical junction box including a back wall, a top wall and side walls defining an open cavity having a mouth, at least one separate mounting bracket disposed within said mouth and secured onto the top of a support member located within said cavity, said mounting bracket including at least one hole, said extender comprising a top wall, a bottom wall and side walls of the same length as those of said box and defining an open ring, said extender being arranged for securement to said box by the abutment of the peripheral edges of its wall with the peripheral edges of the walls of the box, said extender including at least one plate portion disposed within said ring and including a hole therein aligned with the hole in the mounting bracket, screw means extending through said aligned holes to secure the extender to the box and at least one projection located within the ring and having a free end extending slightly beyond the plane of the peripheral edges of



the walls of the extender, whereupon said free end applies a holding force onto said mounting bracket when said screw is tightened, to thereby preclude said bracket from being pulled off of the top of said support member.

4,223,797

STORAGE TANK

Mikhail G. Skakunov, ulitsa Zelenaya, 6, kv. 60, Moskovskoi oblasti, Moscow, U.S.S.R.

Filed Feb. 9, 1978, Ser. No. 876,527
Int. Cl.[3] B65D *8/08, 25/24, 90/12*
U.S. Cl. 220—5 A **4 Claims**

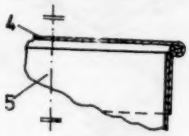
1. A storage tank comprising: a thin-walled shell in the form of a plurality of segments comprising a body of revolution; supporting uprights on which said shell is mounted; guides equispaced around the external surface of said shell, along its generatrix; flexible elements mounted in said guides and secured to said supporting uprights; tensioning devices mounted on the top and bottom of said shell; one end of each of said flexible elements being attached to one of said tensioning devices; and the other end of each of said flexible elements being attached to the other of said tensioning devices.

4,223,798

CAN FOR PRESERVING FOODSTUFFS AND PROCESS FOR ITS MANUFACTURE

Jean Schrade, Zurich, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jun. 14, 1979, Ser. No. 48,689
Claims priority, application Switzerland, Jul. 6, 1978, 7368/78
Int. Cl.[3] B65D *6/34, 8/04, 8/08*
U.S. Cl. 220—66 20 Claims



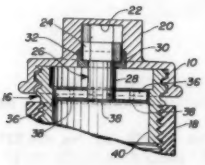
1. A can particularly suitable for preserving foodstuffs comprising a body which is basically cylindrical in shape and top and bottom parts fixed to the said can body, wherein the can body is made of an aluminum-plastic composite and is permanently affixed at one end directly to said bottom part and at the other end of said top part via a metal ring which is adhesively secured to said can body and flanged only to said top part.

4,223,799

RELEASABLE LOCKING MEANS FOR CLOSURE CAPS

Charles G. Eyster, York, Pa., and Holbrook C. Bissell, West Chester, Pa., assignors to Time Saving Falls, Inc., York, Pa.

Continuation-in-part of Ser. No. 963,584, Nov. 24, 1978, abandoned. This application Jun. 11, 1979, Ser. No. 47,245
Int. Cl.[3] B65D *51/00, 43/26;* E05B *47/00;* F16B *37/14*
U.S. Cl. 220—230 28 Claims



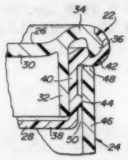
1. Releasable locking means for a hollow circular member open at one end and a cup-shaped closure cap of non-magnetic material complementary in shape to the exterior of said open end of said circular member and coengageable with each other by complementary coengageable securing means operable by rotation of said cap relative to said circular member, in combination with a locking member of ferrous material supported by said cap for axial movement relative thereto, means on said cap engaging said locking member to prevent rotation thereof relative to said cap but permit limited axial movement between operative and inoperative positions relative to said circular member when said cap is secured thereto, said circular member having a fixed locking configuration therein, and said locking member on said cap having securing means thereon movable therewith when moved axially and engageable with said fixed locking configuration in said circular member when said locking member is in said locking position relative to said cap, thereby to prevent rotation of said cap relative to said circular member, said locking member being movable into said operative position by gravity when said circular member is substantially vertical and said cap is secured thereto, and said locking member being movable vertically upward to said inoperative position upon application of a magnet to said cap and thereby move said securing means on said locking member axially toward said cap and disengage the same from said locking configuration in said circular member and thereby permit rotation of said cap relative to said circular member.

4,223,800

REFRIGERATOR CONTAINER

Aaron H. Fishman, Hewlett Harbor, N.Y., assignor to APL Corporation, Great Neck, N.Y.

Filed Aug. 17, 1979, Ser. No. 67,653
Int. Cl.[2] B65D *43/04, 43/08*
U.S. Cl. 220—352 6 Claims



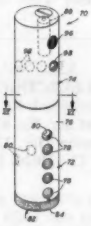
1. A container for food, said container including a receptacle portion comprising a material which is resistant to flexing and a lid for sealing the container, said lid having a first portion which comprises a material resistant to flexing and a resilient portion, said first portion including a peripheral flange which extends parallel to the inner surface of the mouth of said receptacle portion, the outer surface of said peripheral flange being substantially the size of, but slightly smaller than the inner surface of the mouth of said receptacle portion, said resilient portion of said lid including a band that fits around the outer surface of the peripheral flange of said inflexible portion so that when said lid is used to close said container there is a tight fit between said lid and the mouth of said receptacle as said band of said resilient portion is in tight contact with the mouth of said receptacle portion, said first portion of said lid having the same shrinking characteristics as the receptacle portion so that a tight fit between the lid and the receptacle at room temperature remains tight when the container is placed in a cooler atmosphere.

4,223,801

AUTOMATIC PERIODIC DRUG DISPENSING SYSTEM

Torsten S. Carlson, 1077 Wicke Ave., Des Plaines, Ill. 60018

Filed Jan. 26, 1978, Ser. No. 872,496
Int. Cl.[2] B65D *83/04*
U.S. Cl. 221—3 13 Claims



1. An automatic periodic drug dispensing device for use in administering predetermined doses of pharmaceutical preparations to an individual comprising:

a plurality of drug storage chambers each adapted to receive a prescribed medicament and being arranged in a predetermined sequence and with a given capacity for dispensing the medicaments over a given time period,

a timing means being discernible by a user of the prescribed medicaments,

an automatic signal means associated with said timing means and arranged to identify specific times when each of said prescribed medicaments is to be taken, and

a coding means associated with each of said plurality of drug storage chambers and said timing means, whereby said prescribed medicaments may be identified for dispensing in a predetermined time sequence,

said dispensing device comprising a self-contained unit and said timing means includes an electrical circuit having means to energize said automatic signal means at preselected times to emit discernible alarm signals,

wherein said electrical circuit includes a holding circuit and a reset means whereby said holding circuit is adapted to maintain the signal means in an energized state until deactivated by the reset means, and wherein said reset means deactivates said signal means coincidentally with the dispensing of an appropriate medicament.

4,223,802

DEVICE FOR INTRODUCING SMALL OBJECTS IN THE PACKAGING OF ARTICLES

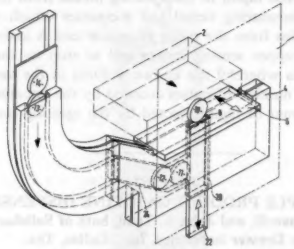
Berthold Winter, Hamburg, Fed. Rep. of Germany, assignor to G.D. Societa per Azioni, Bologna, Italy

Filed Oct. 2, 1978, Ser. No. 947,399

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1977, 2744760

Int. Cl.³ B65H *3/24*

U.S. Cl. 221—268 **6 Claims**



1. A device for enclosing small objects when packing articles in a packaging machine, the device comprising a feed chute for said objects, a delivery chute in communication with said feed chute and having an outlet, a reciprocatable push rod slidably mounted in the delivery chute to move said objects through the delivery chute in a controlled manner, and a separate member positioned between the delivery chute outlet and the articles being packaged, said separate member having means defining at least one opening therein for permitting the passage of said objects therethrough which have been moved through the delivery chute, said separate member being reciprocatable in the feed direction of said articles between a first position blocking the delivery chute outlet and a second position in which the delivery chute outlet is aligned with said means defining at least one opening.

4,223,803

GAS STORAGE SYSTEMS

Arthur E. Pearson, Cwmbran, Wales, assignor to British Steel Corporation, London, England

Continuation of Ser. No. 550,609, Feb., 1975. This application Feb. 2, 1977, Ser. No. 765,105

Claims priority, application United Kingdom, Feb. 26, 1974, 8673/74

Int. Cl.² B67D *3/00*

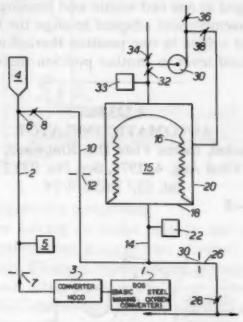
U.S. Cl. 222—3 **19 Claims**

1. In combination with apparatus which evolves gas durng an operation and releases at least a given quantity of gas suitable for storage through a gas outlet of said apparatus during a portion of said operation, an improved gas storage and discharge system which comprises container means for storing said gas at substantially atmospheric pressure, said storage means comprising

collapsible container means dimensioned to hold substantially said given quantity of said gas suitable for storage,

conduit means between said gas outlet, said collapsible container means, and a discharge point,

valve means associated with said conduit means for selectively connecting said container means to said outlet and to said discharge point,



said valve means being operable to continuously connect said container means to said outlet only so long as said gas suitable for storage is being released through said outlet, and

additional means operable other than by the pressure of the gas in said outlet and in said conduit means to cause continuous expansion of the container so as to permit gas to be continuously transferred from said outlet for storage in said container while said gas suitable for storage is being released through said outlet, said additional means including means to cause contraction of said container to enable stored gas to be discharged from said container to said discharge point.

4,223,804

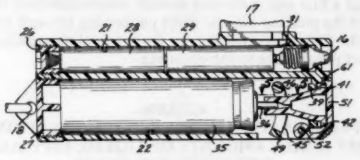
PERSONAL DEFENSE DEVICE

Bob H. Morris, and Barbara O. Morris, both of 4243 Myrtle Ave., Long Beach, Calif. 90807

Filed Apr. 30, 1979, Ser. No. 34,651

Int. Cl.³ F41F *15/00*

U.S. Cl. 222—3 **5 Claims**



1. A personal defense device comprising:

a hollow housing including a first elongate cavity formed on the interior thereof, said first cavity terminating in an orifice at one end thereof;

a container of compressed gas received on the interior of said first cavity, said container including a dispensing nozzle at one end thereof adapted to dispense said compressed gas upon the inward articulation thereof, said container being aligned in said first cavity to deploy said nozzle towards said orifice;

a throat assembly generally formed as a conical frustum surface engaging the nozzle and providing a discharge flow path for the compressed gas issuing from the nozzle, said throat assembly disposed in the cavity at said one end and aligned to translate within said orifice to effect the articulation of said nozzle, said throat assembly including two exteriorly directed opposed projections on the exterior thereof;

a pivoted lever suspended inside said housing for pivotal articulation and aligned to translate said projections on said throat assembly thereby; and

a pivoted trigger assembly conformed as an L-shaped surface hinged at one end within said housing proximate said throat assembly and adapted to align the free leg thereof over said orifice in one position thereof and to movably engage said lever in another position thereof.

4,223,805

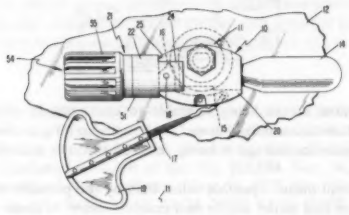
AUTOMATIC INFLATOR

Glenn H. Mackal, Buena Vista Dr., Ringwood, N.J. 07456

Filed Aug. 4, 1978, Ser. No. 931,271

Int. Cl.[3] B63C *9/24*

U.S. Cl. 222—5 **14 Claims**



1. A gas inflator for an inflatable article, the inflator being selectively operable either manually or automatically upon its subjection to water, comprising an inflator body, means for attaching a gas-containing capsule to said body, a capsule-piercing pin movable in the body toward the capsule, manually operated means acting directly on the outer end of the piercing pin to thrust the inner end of the piercing pin toward the capsule, a second pin aligned with the piercing pin and having an end confronting and adapted selectively to engage said outer end of the piercing pin, and automatically operated means responsive to its subjection to water to thrust the second pin axially against the said end of the piercing pin to thrust the piercing pin toward the capsule, the manually operated means for thrusting the piercing pin toward the capsule comprising a rotable cam directly engaging the said end of the piercing pin, and a pivot pin mounting the cam on the body, the second pin having a first slot in the end thereof which confronts the said end of the piercing pin, the pivot pin passing through said first slot, the first slot permitting the longitudinal movement of the second pin relative to the pivot pin.

4,223,806

APPARATUS FOR THE PULSED DISPENSATION OF VERY SMALL AMOUNTS OF LIQUID, ESPECIALLY HYDROGEN PEROXIDE

Gerhard Buschmann, Düsseldorf, Fed. Rep. of Germany, assignor to Jagenberg Werke Aktiengesellschaft, Düsseldorf, Fed. Rep. of Germany

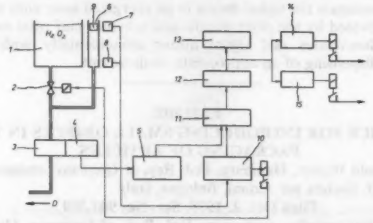
Filed Feb. 23, 1978, Ser. No. 880,527

Claims priority, application Fed. Rep. of Germany, Feb. 26, 1977, 2708422

Int. Cl.[2] B67D *5/32*

U.S. Cl. 222—23 **5 Claims**

1. An apparatus for the pulse-wise dispensing of very small amounts of liquid controlled with a measuring instrument, wherein the improvement comprises the measuring instrument comprising ejecting means for the pulse-wise ejection of a desired amount of liquid, a measuring vessel having a volume greater than the volume of the liquid to be ejected for each pulse and having an outlet connected to the ejecting means and wherein the cross section of the vessel is adapted to the amount of liquid to be controlled, sensing means having an upper and a lower sensing device positioned at said vessel and responsive to the level of the liquid therein with an accuracy of about from one to five amounts of liquid to be ejected and generating a signal when the upper and lower sensing devices are activated, a pulse generator synchronized with the ejecting means,



a reservoir situated lower than the measuring vessel, a pump controlled by the sensing means for pumping liquid from the reservoir to the vessel, whereby shutting the pump on and off alternately feeds liquid to the ejecting means from the reservoir or the measuring vessel and a counter which receives counting pulses from the pulse generator and is activated to start by the upper sensing means and to stop by the lower sensing means whereby the known volume in the vessel, divided by the number of pulses counted by the counter, measures the amount of liquid ejected by the ejecting means for each pulse.

4,223,807

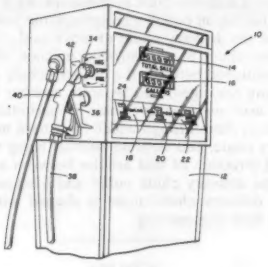
MULTIPLE PRODUCT GASOLINE DISPENSER

Richard L. Caswell, and John A. Todd, both of Salisbury, Md., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Feb. 8, 1979, Ser. No. 10,294

Int. Cl.[3] B67D *5/08*

U.S. Cl. 222—28 **7 Claims**



1. A multiple product gasoline dispenser including in combination:

(a) a dispenser housing;

(b) a first dispenser system adapted to be connected to a source of unleaded gasoline from inward of said housing;

(c) a second dispenser system hydraulically isolated from said first dispenser system and adapted to be connected to at least one source of leaded gasoline from inward of said housing;

(d) selector means on said housing operable when predeter-

minably set in dispensing relation to enable actuating one or the other of said dispensing systems;

(e) first interlock means operable in conjunction with operating said selector means for enabling actuating said first dispenser system to prevent actuating said second dispensing system;

(f) second interlock means operable in conjunction with operating said selector means for enabling actuating said second dispenser system to prevent actuating said first dispenser system; and

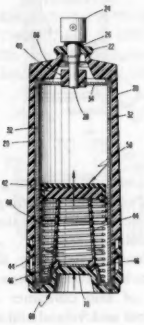
(g) a computer common to both of said dispenser systems for calculating dispensing data of each individual dispenser transaction effected by either of said dispenser systems.

4,223,808

REFILLABLE DISPENSING DEVICE HAVING WIPER SEAL

John E. Williams, Del Mar, and Lester H. Rabe, Palm Deserts, both of Calif., assignors to Spray Safe Company, Inc., Fullerton, Calif.

Filed Jul. 21, 1978, Ser. No. 926,639
Int. Cl.² B65D *17/24*
U.S. Cl. 222—88 **16 Claims**



11. A fluid material dispensing device, comprising:

a separate, disposable, one-use refill assembly, consisting essentially of a rigid cylindrical sleeve and within said sleeve a supply of fluid material to be dispensed, said refill assembly having an elastically sealable aperture in the top thereof and having a pressure-supplying assembly in the bottom thereof, the pressure-supplying assembly consisting essentially of a piston means for urging the supply of fluid within the sleeve, a bottom member, a compression spring mounted between said bottom member and said piston means and locking means for releasably restraining said compression spring in a compressed state, the locking means being carried by the piston means; and

a re-usable dispenser assembly consisting essentially of:

a casing having an open bottom and a top wall provided with an opening, said casing being dimensioned to contain said refill assembly;

an aerosol valve assembly secured in said opening;

a bottom cap for said casing, said bottom cap being capable of movement relative to said casing and carrying unlocking means for unlocking said locking means in response to said movement and

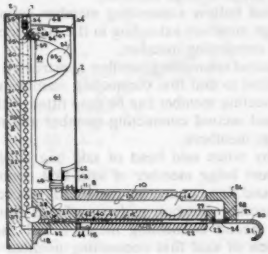
said aerosol valve assembly including a stem portion adapted to be inserted into the interior of said refill assembly through the elastically sealable aperture.

4,223,809

DISPENSING DEVICE

Ronald D. Martin, 9804 Hearthside Cir., Shreveport, La. 71118

Filed Oct. 10, 1978, Ser. No. 949,667
Int. Cl.² B65D *35/54*
U.S. Cl. 222—96 **11 Claims**



1. A dispensing device comprising:

(a) a container having an outlet passage and including an upward standing base, a cover base attached to said base, a horizontally disposed brush holder having one end attached to said cover base, and a cover removably fitted over said base, said cover base, and a portion of said brush holder;

(b) clamp means within said cover and mounted on said base for supporting a collapsible tube with the mouth of said tube cooperating with said outlet passage;

(c) a pull chain having discreet balls connected in spaced relationship by discreet links, and a spring carrying one end of said chain and mounted in the interior of said container;

(d) a slotted lever slidably carried by said brush holder and positioned beneath said outlet passage and carrying the opposite end of said chain from said spring; and

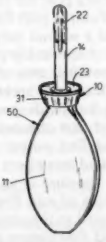
(e) tube collapse means including a carriage slidably and vertically carried by the interior wall of said base; a retaining means fitted to said carriage for selectively engaging said balls of said pull chain; and a roller rotatably attached to said carriage and positioned against said collapsible tube to force said collapsible tube against the inside of said cover responsive to engagement of said retaining means with said balls by manipulation of said lever.

4,223,810

SYRINGE CLOSURE WITH ATTACHABLE NOZZLE

Vincent R. Sneider, 3422 Hallcrest Dr., Atlanta, Ga. 30319

Filed Dec. 7, 1978, Ser. No. 967,461
Int. Cl.² A61M *1/00*
U.S. Cl. 222—107 **8 Claims**



1. A closure means for a syringe bag having a resilient neck portion with a bead comprising:

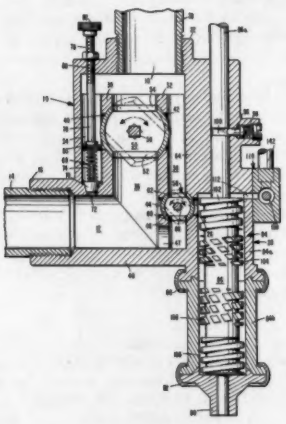
a hollow nozzle member defining a hollow spray stem having an externally threaded inlet and an outlet end;
a first connecting member defining a hollow body section with internal threads complementary to said external threads of said nozzle member;
a support ledge member extending from said body section;
a wall portion defined by said body section and spaced from said support ledge member;
a second hollow connecting member defining two spaced flange members extending in the direction of the inside of said connecting member;
said second connecting member constructed and arranged in relation to said first connecting member so that said first connecting member can be snap fitted within the confines of said second connecting member and retained by said flange members;
whereby when said bead of said bag is placed over said support ledge member of said first connecting member and said first connecting member is placed in said second connecting member, said one of said flange members of said second connecting member will engage said wall portion of said first connecting member and said other flange member will resiliently hold a portion of said bag against said support ledge.

4,223,811

FLUID METERING, MIXING AND DISPENSING MACHINE

Imre Czegledi, 10 Mill St., Paterson, N.J. 07501

Filed Dec. 15, 1975, Ser. No. 640,789
Int. Cl.[2] B29B *5/00*; B01F *7/24*
U.S. Cl. 222—136 **15 Claims**



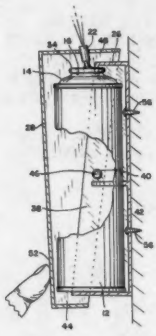
1. Apparatus for dispensing a fluid, comprising,
a housing having an entry port for receiving said fluid from a fluid source, a first output port for returning said fluid to said fluid source and a second output port for dispensing said fluid, the area of said entry port being substantially equal to the cross-sectional area of said first output port;
a partition having at least one aperture therein positioned within said housing for dividing said fluid into first and second channels, said first channel connecting said entry port directly to said first output port and said second channel connecting said entry port to said first and second output ports via the aperture in said partition, the sum of the cross-sectional area of said first and second channels being substantially equal to the cross-sectional area of said entry port and of said first output port; and
a valve interposed between the aperture in said partition, said second channel and said second output port for dividing the fluid entering said aperture between said first and second output ports, said valve being adjustable to permit dispensing all or a portion of the fluid flowing through the aperture in said partition to said second output port and the remainder of the fluid flowing through said aperture to said first output port without significantly changing the amount of fluid entering said entry port from said fluid source.

4,223,812

WALL MOUNTED RECEPTACLE FOR AEROSOL CANS

Klass J. van Lit, Amstelveen, Netherlands, assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed Nov. 22, 1977, Ser. No. 853,961
Claims priority, application United Kingdom, Nov. 22, 1976, 48668/76
Int. Cl.[2] B05B *17/00*
U.S. Cl. 222—180 **2 Claims**



1. A wall-mountable aerosol dispensing device comprising:
a cylindrical aerosol container including, at a valved end, a valve cup and tilt-actuatable valve stem protruding therefrom along the container axis;
a wall-mountable bracket receiving and supporting said container, said bracket having securing means preventing radial movement of said container and pivot bearings thereon spaced from said valved end and defining a pivot axis parallel to a radius of said container; and
a shroud member substantially enclosing said container and said bracket and pivotally attached to said bracket through pivot means engaged with said pivot bearings, said shroud member defining an opening receiving and engaging said stem.

4,223,813

NONCRITICALLY ALIGNED VALVING DEVICES FOR FLOW RATE-LIMITING CASSETTES USED IN INTRAVENOUS SOLUTION ADMINISTERING EQUIPMENT

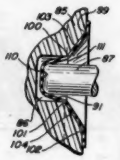
Scott T. Garrett, Highland Park; Thurman S. Jess, Mundelein; Vincent L. Knigge, Mundelein; Lee K. Kulle, Mundelein; William L. Rudzena, McHenry, and Nick Zissimopoulos, Schaumburg, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 17, 1978, Ser. No. 878,847
Int. Cl.[2] A61M *5/14*
U.S. Cl. 222—447 **9 Claims**

1. In a device for controlling fluid flow through a flow path, a pair of alternatively operating, spaced valve means, controlling flow through said flow path, each valve means including a flow aperture defining an annular edge across which said flow path extends, a movable valve member comprising an elongated rod member, and a membrane positioned between said flow aperture and valve member, said valve member being

adapted to move said membrane into and out of contact with said edge to respectively block and allow fluid flow through said flow path across said edge, the improvement comprising, in combination:

said valve member having an outer transverse dimension which is smaller than the inner transverse dimension of



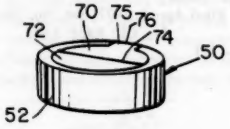
said flow aperture, whereby said valve member is insertable into said flow aperture in spaced relation thereto, to draw said membrane into said sealing contact with said edge, said flow path entering the flow aperture across a first portion of the annular edge and exiting said flow aperture across a second portion of said annular edge.

4,223,814

EXPANDABLE SYRINGE AND SPRINKLER CAP THEREFOR

Vincent R. Sneider, 3422 Hallcrest Dr. N.E., Atlanta, Ga. 30319

Division of Ser. No. 756,237, Jan. 3, 1977, Pat. No. 4,168,032.
This application Feb. 15, 1979, Ser. No. 12,255
Int. Cl.[3] B65D *47/08*
U.S. Cl. 222—565 **6 Claims**



1. A sealable sprinkler cap for a receptacle comprising a tubular member adapted to be mounted to a receptable outlet; a sprinkler plate mounted within said tubular member and having a plurality of apertures therethrough, said sprinkler plate having an elongated plate ledge defining a fulcrum extending between opposed interior surfaces of said tubular member; and an articulated cover joined to said tubular member at a joint aside said sprinkler plate and having two cover sections hinged together along an elongated hinge parallel said plate ledge between said plate ledge and said cover joint, a plurality of plugs depending from one of said cover sections and insertable into said apertures, and said elongated hinge being located sufficiently close to the fulcrum defined by said plate ledge to provide a mechanical advantage whereby slight depression of the other of said cover sections causes said plugs to be completely withdrawn from said apertures as said one cover section pivots about said fulcrum.

4,223,815

POST FORM STAY INSERTER FOR SHIRT COLLARS

William O. Mitchell; Walter C. Frost, and C. Ray Hamilton, all of Vidalia, Ga., assignors to Oxford Industries, Inc., Vidalia, Ga.

Filed Sep. 25, 1978, Ser. No. 945,214
Int. Cl.[2] A41D *27/18*; A41H *33/00, 43/00*
U.S. Cl. 223—2 **6 Claims**

1. A method of inserting collar stays into collars comprising the steps of moving a pair of collar stays with pointed ends extending in their directions of movement along the surface of a collar template until the pointed ends of the collar stays are in registration with the pointed portions of the collar template, inserting a partially completed collar about the template, si-

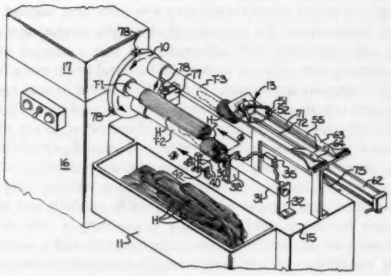
multaneously pressing the collar against both of the collar stays and removing the collar with the collar stays inside the collar from the template.

4,223,816

HOSIERY CUFF FORMING APPARATUS

Clarence J. Glover, Denton, N.C., assignor to Surratt Hosiery Mill, Inc., Denton, N.C.

Filed Feb. 5, 1979, Ser. No. 9,169
Int. Cl.[3] A41H *33/00*
U.S. Cl. 223—37 **6 Claims**



1. An apparatus for forming a folded cuff on a hosiery article having an open end and a closed toe end, said apparatus comprising

(a) a tubular member including an open free end over which the open end of the hosiery article is adapted to be drawn so that the closed toe end of the hosiery article covers said open free end of said tubular member,

(b) plunger means including a free end aligned with and adapted to pass into said open free end of said tubular member,

(c) means supporting said plunger means for reciprocating movement a predetermined distance into and out of said open free end of said tubular member so that said free end of said plunger means engages and moves the closed toe end of the hosiery article inwardly of said tubular member when reciprocated into said tubular member, leaving a cuff portion on the outside of and overlying and encircling a portion of said tubular member adjacent said open free end and the portion of the hosiery article positioned on the inside of said tubular member, and

(d) gripper means supported for reciprocating movement parallel to said tubular member and adjacent said open free end of said tubular member, and

(e) operator means for moving said gripper means inwardly

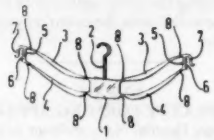
to said open free end of said tubular member to grip the hosiery article with the cuff on the outside of said tubular member and the reaminder of the hosiery article on the inside and for then moving said gripper means outwardly and away from said open free end of said tubular member and in a direction parallel to said tubular member to withdraw the cuffed hosiery article from said tubular member.

4,223,817

GARMENT HANGER

Martin G. Hazenveld, P.O. Box 90, 5750 AB Deurne, Netherlands

Filed Feb. 12, 1979, Ser. No. 11,655
Claims priority, application United Kingdom, Feb. 17, 1978, 6453/78
Int. Cl.[2] A47J *51/10*
U.S. Cl. 223—94 **4 Claims**



1. A garment hanger comprising a central body, a first pair of parallel upwardly inclined tensioning arms disposed at one side of said central body, said tensioning arms each having ends adjacent to and remote from said central body, a cross arm disposed at said remote tensioning arm ends, first, second, third and fourth means for respectively hingedly connecting a first of said tensioning arm adjacent ends and a second of said tensioning arm adjacent ends to said central body and a first of said tensioning arm remote ends and a second of said tensioning arm remote ends to said cross arm, a second pair of parallel upwardly inclined tensioning arms disposed at a side of said central body opposite said one side, said second pair of tensioning arms each having ends adjacent to and remote from said central body, another cross arm disposed at said second pair of tensioning arm remote ends, fifth, sixth, seventh and eighth means for respectively hingedly connecting a first of said second pair of tensioning arm adjacent ends and a second of said second pair of tensioning arm adjacent ends to said central body and a first of said second pair of tensioning arm remote ends and a second of said second pair of tensioning arm remote ends to said another cross arm, means connected directly to only said central body for suspending said hanger from a suitable support, said first and second pair of tensioning arms being movable about said first through eight hingedly connecting means between a first position more adjacent said suspending means and a second position more remote from said suspending means, and means defined by the natural resilience of the material of said hanger for spring biasing said tensioning arms from said first position toward but not beyond said second position whereby said cross arms will be disposed at a maximum spaced distance from each other less than what the distance would be if said first and second pairs of tensioning arms were not inclined and were in general alignment with each other.

4,223,818

WOOD CARRIER

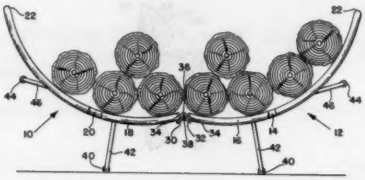
Carl O. Johnson, Rte. 1, Box 73, Woodstock, Conn. 06281

Filed Aug. 30, 1979, Ser. No. 71,364
Int. Cl.[3] B65D *71/00*; A47F *7/00*; F16M *11/38*
U.S. Cl. 224—45 E **5 Claims**

1. A wood carrier comprising two like parts, each part formed of elongated material in the form of a U, the open ends of the two Us being adapted to be separably connected, a removable pin connecting the parts at their open ends,

each part being bent to provide curved portions facing each other,

handles projecting exteriorly of the parts intermediate the ends thereof,



said handles together supporting the carrier on floor or ground with the parts in generally spaced relation providing storage for the wood,

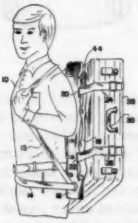
and means at the open ends of the parts engaging the ground in coplanar relation with the handles, or being selectively raised, spreading the parts, and enlarging the capacity of the carrier as it rests only on the handles.

4,223,819

SUITCASE WITH A BACK PACK ADAPTOR

Patrick P. Wright, c/o Serendipity Unlimited, Box 4386, Anchorage, Ak. 99509

Filed Apr. 5, 1977, Ser. No. 784,695
Int. Cl.[2] A45F *3/00*
U.S. Cl. 224—211 **7 Claims**



1. A back pack adaptor for a suitcase, comprising:

a pack frame with a plurality of holes formed therein;

means of attaching the pack frame to a back of a user, including a set of shoulder straps attached to a front of the pack frame and a waistband attached to a lower portion of the pack frame;

a suitcase removably attachable to the pack frame;

a pack sack removably attachable to the pack frame and supportable between the pack frame and the suitcase;

a hook attached to an inner edge of the frame adjacent to one of the holes in the back frame and removeably attached to a grommet located in an edge of the pack sack, and

a canvas panel attached by means of a strap to the front of the pack frame,

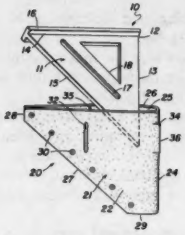
wherein the means of attaching the suitcase to the pack frame comprises the pack frame forming a pair of slots, and a strap, attached to the suitcase by a plurality of pop rivets, insertable through the slots and attachable around the suitcase, whereby the suitcase may be attached to the pack frame.

4,223,820

HOLDER FOR TRIANGULAR CARPENTER'S SQUARE

Guy E. Vorsanger, 15 Elder La., La Grange, Ill. 60525, and Michael J. Nickel, 107 McCameron Ave., Lockport, Ill. 60441

Filed Jul. 3, 1978, Ser. No. 921,833
Int. Cl.[2] A45C *1/04, 11/36*
U.S. Cl. 224—253 8 Claims



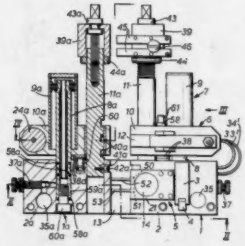
1. A belt-mountable holder for a triangular carpenter's square having a laterally extending flange along one side edge thereof, said holder comprising a flexible sheet of unitary single-piece construction arranged in a single-folded configuration, said sheet including a front panel and a rear panel disposed in overlapping relationship with each other and a fold portion interconnecting said front and rear panels along a fold line, each of said front and rear panels having a straight top edge with said top edges being substantially parallel with each other and interconnected by said fold portion, means securing together said front and rear panels along a straight closure line disposed at a predetermined acute angle to said fold line for cooperation with said fold portion and with said front and rear panels to define a substantially triangular pocket dimensioned to accommodate therein an associated triangular carpenter's square so that the flange thereof is supported on said top edges, and means for attaching said holder to the belt of a user.

4,223,821

PRESS-FEED UNITS

Arthur A. McCall, 16-22, Market Pl., Warwick, England

Filed Jan. 31, 1978, Ser. No. 873,839
Int. Cl.[2] B65H *17/26*
U.S. Cl. 226—101 8 Claims



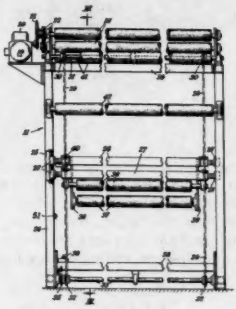
1. A press-feed unit comprising an assembly including a body adapted for fixing adjacent a press, a transport section reciprocable relative to the body, a pneumatic piston and cylinder assembly for reciprocating the transport section, a control valve operable in dependence on press ram position, a transport feed valve for control by a pilot pressure signal from the control valve and operable to feed the transport cylinder of said assembly, and at least one pilot signal connection at which said pilot pressure signal is available and which is readily accessible and connectable to provide a pilot pressure operating signal, when so desired, for the control of a separate unit.

4,223,822

YARN COMPENSATOR FOR A MULTICOLOR YARN WARP PRINTER

Thomas Clitheroe, Blackburn, England, assignor to Edgar Pickering (Blackburn) Limited, Lancashire, England

Continuation-in-part of Ser. No. 817,860, Jul. 21, 1977, abandoned. This application Jul. 27, 1978, Ser. No. 928,407
Claims priority, application United Kingdom, Jul. 26, 1976, 31087/76
Int. Cl.[3] B65H *17/42;* G11B *15/56*
U.S. Cl. 226—118 8 Claims



1. In an apparatus for conveying a warp of yarns from a yarn supply means to an apparatus capable of operating on said yarns, said operaing apparatus being driven by a motor means, the improvement wherein a yarn compensator which stores yarn is disposed between said yarn supply means and the operating mechanism, the compensator including feed rollers operative to draw the yarns from the yarn supply means and means for driving said feed rollers to feed the yarns at a greater rate than they can be accepted by said operating mechanism, a detector disposed between said yarn supply means and said feed rollers for detecting faults in the ends of yarn drawn from said yarn supply means, and an electrical control system operative on detection of a fault by said detector to stop the means driving said feed rollers and to cause said motor to run at a lower speed.

4,223,823

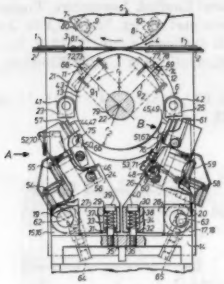
ROTARY WIRE STAPLING APPARATUS

Willi A. P. Kutzner, and Georg Schneider, both of Wurzburg, Fed. Rep. of Germany, assignors to Koenig & Bauer Aktiengesellschaft, Wurzburg, Fed. Rep. of Germany

Filed Aug. 9, 1979, Ser. No. 65,034
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1978, 2835510
Int. Cl.[3] B42B *4/02*
U.S. Cl. 227—81 3 Claims

1. A wire stapling apparatus comprising a rotating staple closing cylinder and a cooperating rotating wire stapling cylinder, with external stapling wire infeed, for stapling individual signatures, having a plurality of sheet layers, in the direction of motion of the signatures, characterized in that a plurality of staple conveyor and staple driving mechanisms are spaced around a periphery of the wire stapling cylinder, each said staple conveyor and staple driving mechanism being capable of rotating around a straight radial line extending from the center of the stapling cylinder to its periphery, an equal number of staple closing mechanisms as staple conveyor and staple driving mechanisms being disposed around a periphery of the

staple closing cylinder to cooperate with said staple conveyor and staple driving mechanisms, each of the staple conveyor and staple driving mechanisms being provided with its individually coordinated wire feed mechanism, wire cutting mechanism, and staple forming mechanism, each of said wire feed mechanisms, wire cutting mechanisms, and staple forming



mechanisms being capable of being rhythmically displaced from the periphery of the wire stapling cylinder when a staple conveyor and staple driving mechanism, which is not coordinated to said wire feed mechanism, wire cutting mechanism, and staple forming mechanism, passes by said wire feed mechanism, wire cutting mechanism, and staple forming mechanism.

4,223,824

METHOD OF MULTI-BEAD WELDING OF TWO WORKPIECES AND APPARATUS FOR CARRYING OUT THE METHOD

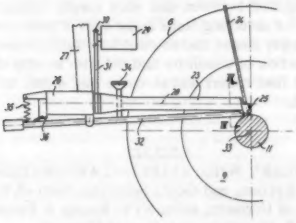
Erik Hansen, Gentofte, Denmark, assignor to Burmeister & Wain A/S, Copenhagen, Sweden

Filed Apr. 16, 1979, Ser. No. 30,438

Claims priority, application Denmark, Dec. 19, 1978, 5700/78; Jan. 11, 1979, 124/79

Int. Cl.³ B23K *9/12*

U.S. Cl. 228—102 **10 Claims**



1. A method of multi-bead welding of two workpieces, comprising:

supporting said workpieces for rotation about a common center line and such that a gap is defined between substantially parallel opposed end faces of said workpieces,

causing said workpieces to rotate in unison about said common center line,

introducing a holder for a filler wire into said gap,

mechanically advancing a filler wire through said holder into said gap,

periodically pivoting said holder together with said filler wire forth and back between one and the other side of said gap at a substantially constant angular velocity,

after each pivoting movement maintaining said holder stationary in its end position as reached thereby, during a period in which said workpieces rotate substantially 360°, and after the expiry of each said period generating a signal for initiating a pivoting movement of said holder to its opposite end position.

2. Apparatus for effecting a multi-bead welding of two workpieces, comprising:

means supporting said workpieces for rotation about a common center line and such that a gap is defined between substantially parallel opposed end faces of said workpieces,

means for rotating said workpieces in unison about said common center line,

a holder for a filler wire and means for mechanically advancing a filler wire through said holder towards a welding position within said gap,

means supporting said holder for pivoting about an axis transverse to said common center line,

a drive motor operatively connected to said holder for pivoting it forth and back about said transverse axis through a predetermined angle and at substantially constant angular velocity,

an actuator connected to said workpieces through a friction coupling for rotation therewith and adapted to generate a starting signal to said drive motor at a predetermined angular position of said actuator,

a stop member and drive means for shifting said stop member between an operative position in which it prevents the rotation of said actuator, and an inoperative position in which the actuator is free to rotate,

and control means operatively connected to said stop member for causing it to stop rotation of said actuator each time the actuator has completed one full revolution and to subsequently release the rotation of the actuator after the expiry of a period of substantially constant duration.

4,223,825

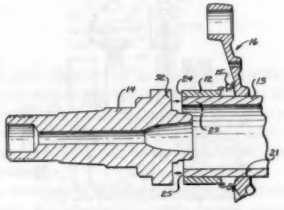
METHOD OF FORMING A VEHICLE AXLE ASSEMBLY

Gerald D. Williams, Indianapolis, Ind., assignor to The Marmon Group, Inc., Chicago, Ill.

Filed Mar. 30, 1979, Ser. No. 25,404

Int. Cl.³ B23K *20/12*

U.S. Cl. 228—114 **9 Claims**



1. The method of forming a vehicle axle assembly comprising the steps of:

coaxially welding a spider having a through opening to a tubular spacer to define a subassembly having a through bore;

removing material formed by the welding operation from within the bore;

installing the subassembly on an axle beam; and

concurrently welding an end of the axle beam and spacer to a spindle.

4,223,826

METHOD OF BRAZING STAINLESS STEELS

Masayoshi Usui, Numazu, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Nagasawa, Japan

Filed Jan. 29, 1979, Ser. No. 7,224
Int, Cl.[2] B23K *1/04, 1/20, 35/28*
U.S. Cl. 228—208 9 Claims

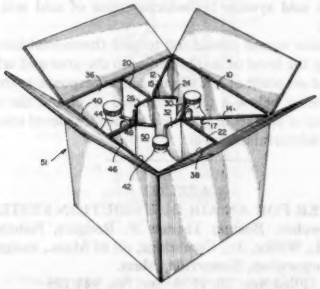
1. A method of brazing stainless steels comprising a step of copper-plating the stainless steel side of both jointing parts of a stainless steel and a metal, a step of heating a brazing material which is a copper base-tin alloy of a melting point of 850° to 1081° C. together with said both jointing parts to a temperature lower than the melting point of copper in a non-oxidizing gas atmosphere and a step of melting the brazing material at said temperature.

4,223,827

HAZARDOUS MATERIALS CONTAINER

Earl F. Gilbert, Farmington Hill, Mich., assignor to Westvaco Corporation, New York, N.Y.

Filed Jan. 17, 1980, Ser. No. 113,104
Int. Cl.[3] B65D *3/24*
U.S. Cl. 229—15 8 Claims



1. A hazardous materials container comprising in combination an outer shipping container and a divider member, said divider member being prepared from a one piece blank to provide a plurality of serially connected panels which are arranged to divide the outer container into at least three compartments for accomodating individual bottles of hazardous materials, said divider member further including integral abbreviated flaps formed from portions of selected divider panels which are adapted to grip the individual bottles for retaining the bottles in place.

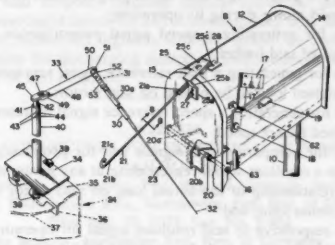
4,223,828

MAILBOX WITH IMPROVED DOOR OPENING MEANS AND FLAG OPERATOR

John A. Whitley, 203 Randolph Ave., and Lacy A. Rowe, 1851 Skycoe Dr., both of Salem, Va. 24153

Filed Apr. 2, 1979, Ser. No. 26,307
Int. Cl.[2] B65D *91/00*
U.S. Cl. 232—45 18 Claims

1. For use in combination with a mail service vehicle, a roadside mailbox especially adapted to be opened and closed by movement of the vehicle past the mailbox, said mailbox including a hollow body having an open end for facing said roadside, a roadfacing door for closing said open end swingable between a closed and an open position, hinge means for mounting said door adjacent the open end of said hollow body, said hinge means having a horizontal axis about which said door swings, means biasing said door to its closed position, and an arm secured to and projecting outwardly from said door to provide a lever arm for swinging said door open, said arm having a mounting portion secured to said door, an intermediate portion extending from said mounting portion, and a hooked end portion remote from said mounting portion, said hooked end portion being curved upwardly from said intermediate portion, said arm being formed from flexible spring wire and having greater flexibility to bend horizontally than vertically, said arm having substantial resistance to bending in a vertical plane, together with a slanted actuating rod adapted to be mounted on a vehicle and engageable with said arm to open said door against the action of said biasing means as the vehicle



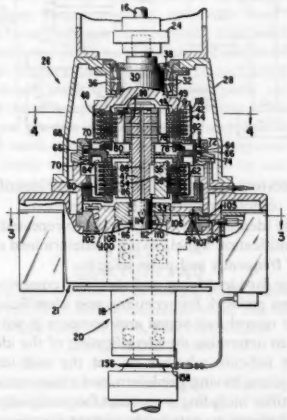
approaches the mailbox, said actuating rod including an elongated downwardly slanted portion having an upper end and a free end at its lower extremity, and mounting means secured to the upper end of said downwardly slanted portion for positioning said downwardly slanted portion outwardly from the side of said vehicle in position for the downwardly slanted portion to engage said arm intermediate the ends of said downwardly slanted portion in order to cam said arm downwardly to open said door as the vehicle moves along the roadside adjacent said mailbox.

4,223,829

CYCLICAL CENTRIFUGAL MACHINE

Joseph B. Bange, Hamilton, Ohio, assignor to The Western States Machine Company, Hamilton, Ohio

Filed Jan. 2, 1979, Ser. No. 257
Int. Cl.[2] B04B *9/10*
U.S. Cl. 233—24 8 Claims



1. In a cyclical centrifugal machine including a solids retaining centrifugal basket and an AC rotary electric motor for driving the basket, a system for controlling transmission of torque from the motor to the basket comprising:

clutch means including relatively rotatable confronting

clutch members adapted to transmit torque through liquid films between them, one set of said members being rotatable with said motor and a second set of said members being rotatable with said basket, means for circulating a liquid to and between said clutch members for torque transmission and from said members for dissipation of heat from liquid, and means for displacing at least one of said sets of said clutch members relative to the other set thereof to vary the pressure applied and thus the torque to be transmitted by said clutch means through said films;

means for generating a load signal proportionate to the load on said motor during its operation;

means for generating a speed signal proportionate to the speed of said basket;

means for generating a load reference signal representing a maximum load to be placed on said motor;

means for generating a speed reference signal representing a desired basket speed;

means for comparing said signals and for producing from them a resultant signal representing at any given moment the relationship of the actual load on said motor to said maximum load; and

means responsive to said resultant signal for operating said displacing means and thus varying said torque so as to produce said maximum load on the motor.

4,223,830

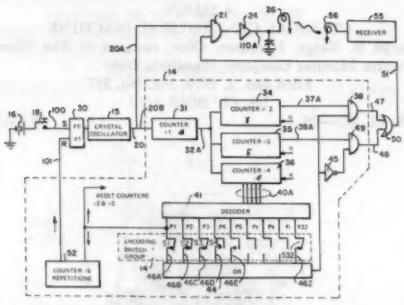
IDENTIFICATION SYSTEM

Charles A. Walton, 19115 Overlook Rd., Los Gatos, Calif. 95030

Filed Aug. 18, 1978, Ser. No. 934,951

Int. Cl.[2] G06K *5/00, 19/06;* **H04Q** *9/02;* **G01S** *9/56*

U.S. Cl. 235—380 **13 Claims**



1. An electronic identification system for identifying signal generating objects, comprising in combination:

a portable identifier including means to repeatedly generate an identification signal having predetermined characteristics of frequency and pulse length;

a detector for identifying said identifier comprising:

an antenna network for receiving said identification signal;

means to record said signal and compare it with a known signal to determine the identification of the identifier;

means to indicate whether or not the said identification signal is one having predetermined characteristics;

said identifier including a constant frequency signal generator and means to gate said constant frequency signal to generate said identification signal including means to divide said constant frequency signal by a predetermined constant to generate a derivative signal; and

said means to gate said constant frequency signal acting responsive to said derivative signal.

4,223,831

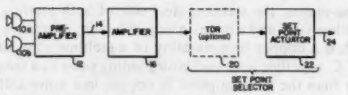
SOUND ACTIVATED TEMPERATURE CONTROL SYSTEM

Jay R. Szarka, 11 Orchard St., Milford, N.H. 03055

Filed Feb. 21, 1979, Ser. No. 13,144

Int. Cl.[3] G05D *23/00;* **G08B** *13/16*

U.S. Cl. 236—47 **4 Claims**



1. A sound activated temperature control system comprising:

thermostatically operated environmental temperature in a predefined area and providing heating and cooling in that area;

thermostat means having at least first and second temperature set points for controlling said sustaining means thereby to control the temperature in said area, said thermostat means including a set of first and second temperature set points for heating and another set of first and second set points for cooling;

means in said system for selecting one of said sets of set points;

and selector means connected to said thermostat means for sensing the level of audible noise in the area and selecting the first set point of one of said sets in response to the noise level being below a predetermined level and the second set point of said set in response to the noise level exceeding said predetermined level.

4,223,832

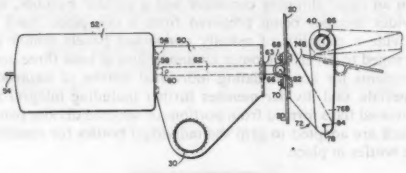
DAMPER FOR AN AIR DISTRIBUTION SYSTEM

Dimiter Gorchev, Boston; Thomas P. Rodgers, Nahant, and Herbert L. Willke, Jr., Cambridge, all of Mass., assignors to Mitco Corporation, Somerville, Mass.

Filed Sep. 20, 1978, Ser. No. 944,135

Int. Cl.[3] F24F *13/10*

U.S. Cl. 236—49 **23 Claims**



18. A damper system for an air distribution system comprising:

an array of damper assemblies, each damper assembly including:

A. A closure element having a perimeter portion seatable on the edge of said input port,

B. an actuating means and associated driving element, said actuating means including a linear actuator and being responsive to an associated control signal to selectively move said driving element between first and second limit positions along an actuator axis, wherein the position of said driving element is related to said control signal,

C. linkage means for coupling said closure element to said input port whereby said closure element is driven between first and second operating positions as said driving element passes between said first and second limit positions, said closure element being seated against said input port in said first operating position, and being linearly displaced from said input port and being rota-

tionally displaced from said first operating position about a first reference axis parallel to the plane of said input port in said second operating position, said linkage means including at least one base pivot member which is pivotable about a base axis, said base axis being fixed with respect to said input port,

a controller including means for selectively generating and applying said control signals to associated actuating means of said array of damper assembly.

4,223,833

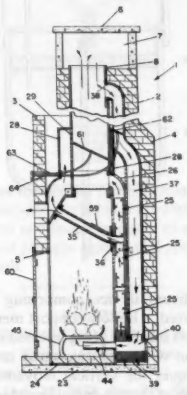
FORCED AIR HEATING FIREPLACE UNIT

Arnold C. Ebbers, 6003 S. Hazel St., Seattle, Wash. 98178

Filed May 8, 1979, Ser. No. 37,053

Int. Cl.³ F24B *7/02*

U.S. Cl. 237—51 **8 Claims**



1. In a heating system for installation in a building during the erection thereof, the combination with a building having a plurality of separate rooms and equipped with an open fireplace in one room having a vertically disposed chimney thereabove, a metal open front firebox unit arranged in said fireplace and comprising a generally rectangular inner firebox unit mounted therein, the side and rear walls of said inner unit being spaced from the corresponding walls of said outer housing, the latter having an open upper end, main heat duct means connected to said open upper housing end for transmitting heat to said rooms, exhaust flue means in said chimney opening into the upper wall of said inner unit, air duct means opening into the upper end of said exhaust flue and projecting vertically downwardly exteriorly and rearwardly of and terminating above the lower end of said outer housing, air distribution chamber means at the lower end of and communicating with said air duct means, a fire grate arranged on the bottom of said fireplace, relatively short spaced air tube means extending forwardly and generally horizontally from said distribution chamber means into the lower end of said inner firebox unit and terminating beneath said grate and generally in the middle thereof, spaced transversely aligned air conducting tube means extending angularly through the front and rear walls of said inner firebox unit adjacent and spanning the upper end thereof, fan casing means having powered blower fan means associated therewith arranged rearwardly of said outer housing and extending thereacross beneath said distribution chamber means and communicating with the spacing between the side and rear walls of said inner and outer units, a plurality of conductive (spaced) metal plate heating core units spacedly and uniformly arranged on and generally covering each of the walls of said inner unit, each of said units including a series of relatively thin heat conductive plates arranged in uniformly closely spaced parallel relation whereby, when a fire is burning in the lower end of said firebox unit and said blower fan means is functioning, warm air and unburned gases exiting through said exhaust flue means will be drawn downwardly through said air duct means into said air distribution chamber means and introduced through said short air tube means into said inner firebox unit beneath the fire therein to enhance combustion, and simultaneously therewith fresh air will be directed by said blower fan means into said fan casing means and circulated upwardly between the walls of said inner unit and housing and between the plates of each of said heating core units so as to be heated thereby and through said spaced angular air conducting tube means for further heating and flow into said main heat duct means, said fireplace opening having warm air discharge means associated therewith and communicating with said main heat duct means and alignable with said spaced air conducting tube means for discharging heated air therefrom into the area in front of said fireplace.

4,223,834

RAIL CONNECTION FOR ELECTRICAL TOY MODEL RAILROADS

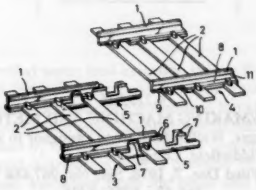
Willi Fechter, Nuremberg, Fed. Rep. of Germany, assignor to Gebr. Fleischmann K.G., Nuremberg, Fed. Rep. of Germany

Filed Jan. 15, 1979, Ser. No. 3,454

Claims priority, application Fed. Rep. of Germany, Jan. 20, 1978, 7801529

Int. Cl.³ E01B *23/04*

U.S. Cl. 238—10 E **10 Claims**



1. A rail connection for connecting track assemblies of a toy model railroad, said track assemblies having a pair of spaced rails mounted on spaced ties, the rail connection comprising connecting clamp members extending between aligned rails of two juxtaposed track assemblies, said clamp members having an elongated base portion and a plurality of spaced generally U-shaped clamp parts extending upwardly from said base portion, said elongated base portion being disposed to underlie the longitudinal end portions of juxtaposed and axially aligned rails and to underlie at least the end tie of each track assembly to be connected, said U-shaped clamp parts each having spaced legs extending upwardly from said base portion into the space between the ties of the rails to clampingly engage the rails of said track assemblies between said spaced ties, said connecting clamp members being assembled on and disassembled from the track assemblies from beneath said track assemblies.

4,223,835

TRACTION PAD

Michael Witt, 106 Avenue P, Brooklyn, N.Y. 11204, and Seymour Brawer, 4706 Arthur St., Hollywood, Fla. 33021

Filed Oct. 23, 1978, Ser. No. 953,628

Int. Cl.² E01B *23/00*

U.S. Cl. 238—14 **9 Claims**

1. A traction pad for use with vehicle tires disposed on a slippery road surface, said pad comprising:

a substantially rectangular mat having a tire facing surface on one side and a road facing surface on an opposite side;

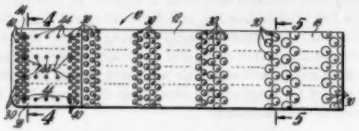
an end portion provided at one longitudinal end of said mat having said tire facing and road facing surfaces thereon;

friction means disposed on said tire and road facing surfaces of said mat for engaging said mat between a tire and the

slippery road surface without relative slippage therebetween;

said friction means extending across said tire facing surface of said end portion but ending short of said road facing surface of said end portion;

guiding means disposed on said road facing surface of said end portion for direction control of the tire during movement of the tire onto said end portion;



a metal plate covering said tire and road facing surfaces of said end portion; and

said plate being provided with finger-like portions for cooperating with said guiding means, said guiding means including longitudinally extending, projecting ribs disposed between said finger-like portions.

4,223,836

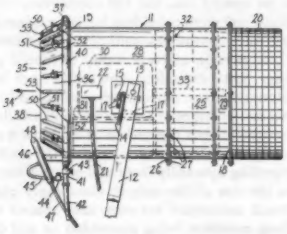
SNOWMAKING MACHINE AND METHOD

Donald W. Eager, Wallingford, Conn., assignor to Zemel Brothers, Inc., Middlefield, Conn.

Filed Dec. 7, 1978, Ser. No. 967,414

Int. Cl.³ F25C *3/04*

U.S. Cl. 239—2 S **26 Claims**



1. An improved method for making artificial snow comprising the steps of:

(a) providing a moving airstream at or below 0° C. within a tunnel-like cowling and directed out of one open end thereof,

(b) passing said airstream through an inwardly tapering conical collar, said conical collar defining the frustum of a hollow cone, whereby the velocity and cooling capacity of said airstream is increased as it passes therethrough,

(c) injecting seeding crystals into said airstream downstream of the point where said airstream exits said conical collar, and

(d) injecting water droplets into said airstream from a plurality of nozzles distributed in an arc of between 190 to 300 degrees around the uppermost portion of the circular opening defined by said conical collar, whereby artificial snow is produced in said airstream.

4,223,837

DOSED DELIVERY DEVICE FOR LIQUIDS, PARTICULARLY FOR DELIVERING WATER TO VEGETAL CULTIVATIONS

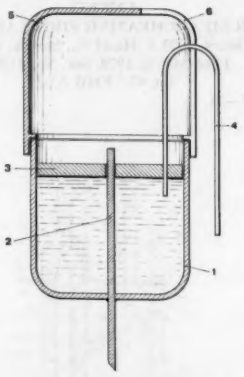
Lino Gubbiotti, Perugia, Italy, assignor to Brevetti Umbria S.r.l., Perugia, Italy

Filed Aug. 15, 1978, Ser. No. 934,089

Claims priority, application Italy, Sep. 14, 1977, 51010 A/77

Int. Cl.³ A01G *25/00, 27/00*

U.S. Cl. 239—50 **2 Claims**



1. A liquid delivery device comprising a tank containing liquid to be delivered, a hollow support member for said tank, said hollow support member being inserted in a tubular support element having an obliquely cut lower end portion, a float located in said liquid for vertical movement in the tank to follow the liquid level therein and at least one syphon capillary having a discharge end positioned in said hollow support member and an inlet end immersed in said liquid, said syphon capillary being positioned on said float for vertical adjustment with respect thereto for effecting a variation in the delivery rate of liquid by the syphon capillary.

4,223,838

SELF-FLUSHING, CONSTANT FLOW EMITTER FOR A DRIP IRRIGATION SYSTEM

Salvatore Maria-Vittorio-Torrisi, Catania, Italy

Continuation-in-part of Ser. No. 777,915, Mar. 16, 1977, abandoned. This application May 3, 1978, Ser. No. 902,488

Claims priority, application Italy, May 25, 1976, 23580 A/76

Int. Cl.² B05B *1/30, 15/02*

U.S. Cl. 239—109 **6 Claims**

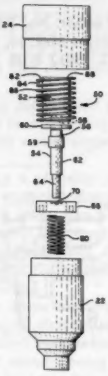
1. An improved emitter having particular utility in a drip irrigation system comprising:

A. a tubular casing characterized by an internal pressure chamber;

B. means for delivering water under pressure to said chamber and means including an orifice for discharging water from said chamber; and

C. means responsive to changes in pressure of water within said chamber for substantially maintaining the rate at which water is discharged from said orifice including a pressure responsive plunger comprising a piston head supported for reciprocating displacement within said chamber in coaxial alignment with said orifice and having a helical rib extended along the surface thereof, disposed in engaged relation with said tubular casing throughout the length thereof defining a multiple-turn path of a constant-length circumscribing the head, a shaft extended from said piston head into said orifice, a spring continuously urging said plunger in axial displacement away from said orifice, flow control means including a first annulus

disposed in spaced concentric relation with said shaft having defined therein a metering slot communicating with said chamber and radially extended across one face thereof defining a stream path, and means including a



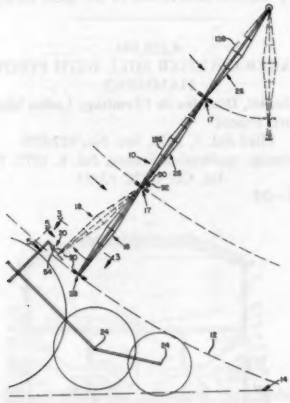
second annulus formed of resilient material mounted on the shaft in concentric relation therewith for engaging the face of said first annulus in response to axial displacement imparted to said plunger against said spring for restricting said stream path.

4,223,839

CORNER WATERING CIRCLE MOVE

Robert W. Bleakney, Eugene, Oreg., assignor to Pierce Corporation, Eugene, Oreg.

Filed Dec. 14, 1978, Ser. No. 969,350
Int. Cl.[3] A01G *25/09*; B05B *3/18*
U.S. Cl. 239—177 **11 Claims**



1. In an irrigation move,

a contractible line move including a plurality of pipe sections and a plurality of carriages carrying the pipe sections at a predetermined height above ground, and adapted to swing about a predetermined pivot so that the outer end of the line move normally is moved along a predetermined circle when the line move is fully extended,

a set coupling member positioned inside said circle at a height such that the line can pass thereover when the line is fully extended,

a movable coupling member carried by the line move at the outer end thereof at the height of the set coupling member,

means for contracting the line to bring the movable coupling member into alignment with the set coupling member so that the movable coupling member is movable into coupled relationship with the set coupling member,

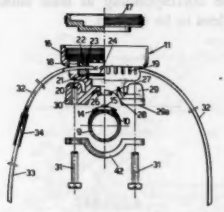
and set sprinklers connected to the set coupling member.

4,223,840

STATIONARY DROP OR FIN STREAM IRRIGATION SYSTEM FOR CITRUS ORCHARDS, FRUIT-TREES, VEGETABLES AND FODDER PLANTS

William La Scala, and Guido Buttiglione, both of Strade Statale 18, Km.417+700 Acconia (CZ), Italy

Filed Oct. 2, 1978, Ser. No. 947,669
Int. Cl.[2] B05B *1/14, 15/06*
U.S. Cl. 239—207 **19 Claims**



1. A controlled water feed irrigation system for plants growing in a field comprising: at least one main liquid distribution pipe connected to a source of a pressurized liquid; a plurality of secondary distribution pipes oriented substantially transversely to rows formed by the plants and in fluid communication with the main liquid distribution pipe; a plurality of vertically oriented conduits extending from the pipes and terminating in upper ends spaced above the ground; means fluidly connecting each vertical conduit with a pipe; a substantially horizontally disposed liquid distribution tube spaced above the ground; means fluidly interconnecting the tube with upper ends of the conduits; a plurality of spaced apart liquid distribution cases mounted to the tube, the tube including a like plurality of holes, and each case including means communicating an inside of the case with an interior of the tube through a corresponding hole, the case further including a plurality of spaced apart slots communicating the inside of the case with the exterior thereof; and a slightly flexible, relatively small diameter tube member extending from the interior of the case through the slots and having a sufficient length to depend from the case in a generally downward direction to a point proximate the ground; whereby the pressurized liquid from the source can flow through the pipes, the conduit and the tube into the interior of the case and hence through the tube members extending through the slots and depending downwardly from the cases to the ground for a metered, low flow dispensing of the liquid to the plants in the field.

4,223,841

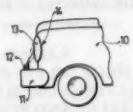
ARRANGEMENT FOR WASHING LENSES OF HEADLIGHTS

Gotthilf Schaller, Leonberg; Eckhard Ursel, Bühl; Werner Fritsch, Gaggenau; Horst Seibicke, Bühl-Altschweier, and Wolfgang Dostler, Lauf, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Nov. 8, 1977, Ser. No. 850,094
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1976, 2654228
Int. Cl.[2] B05B *1/10*
U.S. Cl. 239—284 A **15 Claims**

1. An arrangement for washing headlight lenses of rectangu-

lar outline, comprising means for conveying a washing liquid; and a nozzle provided with a passage having an inlet portion communicating with said conveying means for admitting the washing liquid into said nozzle and an outlet portion diverging toward an open end for discharging the washing liquid from



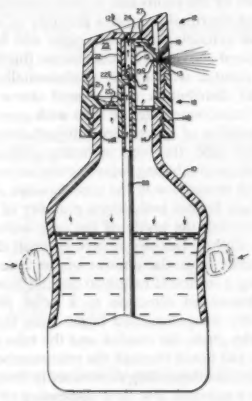
said nozzle and towards the lens to be washed, said outlet portion being bounded by planar surface facets which surround said outlet portion to said open end thereof, and said open end of said outlet portion of said passage having a cross-sectional shape corresponding at least substantially to said outline of the lens to be washed.

4,223,842

SQUEEZE BOTTLE ATOMIZER

Thomas H. Hayes, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Dec. 4, 1978, Ser. No. 966,489
Int. Cl.[2] B05B *1/26*; B65D *1/32*
U.S. Cl. 239—327 **22 Claims**



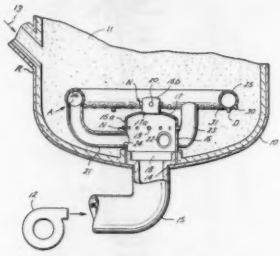
1. An apparatus for dispensing liquid, comprising:
a. flexible container means for storing said liquid;
b. closure means connectable to said container means;
c. film-forming means connected to said closure means, said film-forming means including first post means having first orifice means therein through which gas or air from said container is sprayed;
d. cap means rotatably connected to said closure means, said cap means having second orifice means therein alignable with said first orifice means;
e. stem means connected to said closure means for conveying liquid to said film-forming means; and,
f. dip tube means connected to said stem means for conveying said liquid from said container to said stem means.

4,223,843

AIR DISTRIBUTION APPARATUS

Randlow Smith, Houston; John P. MacLean, Stafford; Dale Williams, Houston; Rich W. Barkley, Houston, and Henry B. Jones, Houston, all of Tex., assignors to Texaco Inc., White Plains, N.Y.

Continuation-in-part of Ser. No. 768,010, Feb. 11, 1977, abandoned. This application Mar. 16, 1978, Ser. No. 887,289
Int. Cl.[2] B01J *8/08, 21/20*
U.S. Cl. 239—558 **11 Claims**



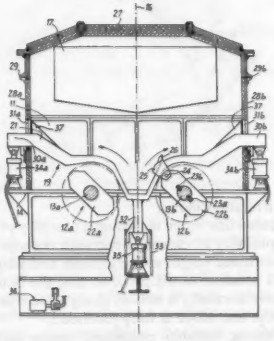
1. A method for forming an air distribution apparatus for a regenerator for providing a maximum air velocity that will not damage spent catalyst therein comprising,
(a) mounting a header ring means on a cylindrical housing means in the regenerator,
(b) attaching high pressure air supply means to the cylindrical housing means for supplying the header ring means,
(c) forming a plurality of nozzles in the header ring means, and in the cylindrical housing means with each nozzle formed with a diverging bore for ejecting high pressure air from the header ring means and cylindrical housing means into the spent catalyst, and
(d) forming the diverging bore of each of the nozzles at a half angle of less than 7° for providing a maximum air velocity without destruction of the spent catalyst.

4,223,844

BREAKER-CRUSHER MILL WITH PIVOTED HAMMERS

Edgard J. Maillet, Domaine de l'Ermitage Ludon Medoc, 33290 Blanquefort, France

Filed Jul. 7, 1978, Ser. No. 922,677
Claims priority, application France, Jul. 8, 1977, 77 21081
Int. Cl.[3] B02C *13/31*
U.S. Cl. 241—33 **15 Claims**



1. A breaker-crusher mill comprising:
(a) a chute;

(b) a crushing chamber fed laterally by said chute, said crushing chamber comprising a reinforced upper wall and two lateral walls, each of said lateral walls comprising a gate adapted to be remotely controlled, said gate being arranged to cover an opening having a lower edge;

(c) two rotors arranged in said crushing chamber, each of said rotors comprising freely pivoting hammers mounted on the periphery of each of said rotors, said hammers being arranged such that the corresponding hammers on each of said rotors face each other as said rotors are rotated;

(d) means for rotating each of said rotors in opposite directions whereby said corresponding hammers are moved in an upward direction as said corresponding hammers face one another;

(e) a grid comprising a plurality of bars, said bars being arranged in planes perpendicular to the axes of said rotors and arranged above said rotors whereby the ends of each of said hammers passes between two adjacent bars over a portion of their trajectory; and

(f) reinforcement means for reinforcing said upper wall of said crushing chamber;

and wherein said chute opens laterally into the section of said crushing chamber situated above said grid and wherein said grid is adapted to be raised from its normal operating position, the lower edge of said opening being situated substantially at the level to which said grid may be raised so as to make possible the automatic ejection of fragments retained by the grid by the contained operation of said rotors.

4,223,845

TOBACCO SHREDDING APPARATUS

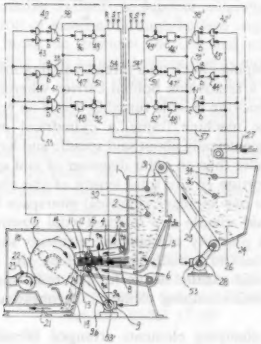
Fritz Selonke, Hamburg; Werner Komossa, Börnsen; Uwe Elsner, Dassendorf, and Gerhard Schlie, Hamburg, all of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co., KG, Hamburg, Fed. Rep. of Germany

Filed Jun. 28, 1978, Ser. No. 919,788

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1977, 2730442

Int. Cl.³ B02C *18/22*; B65G *43/08*

U.S. Cl. 241—34 **10 Claims**



1. In a tobacco shredding apparatus, the combination of a first tobacco-containing magazine; a second tobacco-containing magazine having a capacity greater than the capacity of said first magazine; means for withdrawing tobacco from said first magazine; variable-speed means for comminuting the withdrawn tobacco; variable-speed means for transferring tobacco from said second magazine into said first magazine; first and second signal generating detector means for respectively monitoring the volume of tobacco in said first and second magazines; first control means for regulating the speed of said comminuting means in response to signals from said second detector means so as to maintain the volume of tobacco in said second magazine within a first range; and second control means for regulating the speed of said transferring means in response to signals from said first detector means so as to maintain the volume of tobacco in said first magazine within a second range.

4,223,846

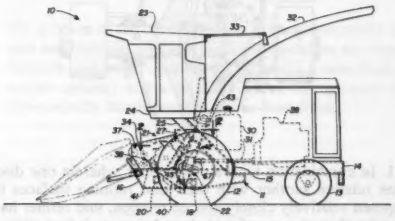
FORAGE HARVESTER

Edward H. Priepke, Stevens, and Robert A. Wagstaff, New Holland, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 3, 1979, Ser. No. 26,499

Int. Cl.³ B02C *18/22*

U.S. Cl. 241—60 **21 Claims**



1. A self-propelled forage harvester comprising in combination:

(a) a longitudinally extending mobile frame having a forward end portion supported by a pair of transversely spaced wheels,

(b) a cutterhead unit mounted on the forward portion of said frame and including a housing having a rear crop outlet opening, a shear bar mounted within said housing, a transverse generally cylindrical cutterhead, means rotatably mounting said cutterhead adjacent said shear bar in cooperative relationship for cutting crop material, and feed means for feeding crop material to said cutterhead,

(c) a blower unit mounted on said frame rearwardly of said cutterhead unit and including a blower unit housing having a crop inlet opening adjacent said rear crop outlet of said cutterhead unit, a fan having blades rotatably mounted within said blower unit housing for rotation in a generally circular path, having upper and lower limits, about an axis for blowing cut crop material upwardwardly and rearwardly away from said forage harvester, said axis being inclined forwardly and upwardly whereby the lower limit of said path is forward of the upper limit, and

(d) a power unit mounted on said frame comprising an engine with output means for driving said cutterhead unit and said blower unit whereby crop material cut by said cutterhead is conveyed to said blower unit via said inlet opening and thence upwardly and rearwardly via said blower unit;

(e) an operator control unit including a platform mounted on the forward end of said frame over said transversely spaced wheels,

(f) said cutterhead unit mounted between said transversely spaced wheels,

(g) said blower unit including a spout extending upwardly and rearwardly from said blower housing, said spout operatively associated with said fan to receive cut material conveyed by said blades, and

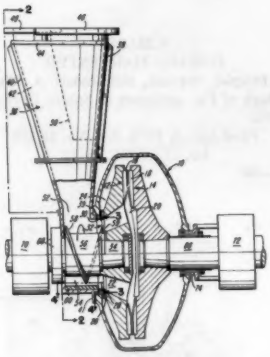
(h) said blower unit mounted below said operator control unit.

4,223,847

COAXIAL FEEDER

Lawrence Tantalo, Springfield; Robert H. Traver, Yellow Springs, and William E. Lyons, Springfield, all of Ohio, assignors to The Bauer Bros. Co., Springfield, Ohio

Filed Nov. 1, 1978, Ser. No. 956,807
Int. Cl.[3] B02C 7/11
U.S. Cl. 241—247 19 Claims



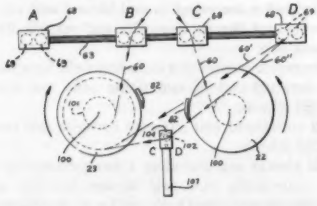
1. In combination with a disc refiner wherein one disc rotates relative another with their disc refining surfaces in an opposed relatively closely spaced relation, said refiner having an inlet thereto, one of said discs being an infeed disc positioned adjacent said inlet and having at least one passage for delivery therethrough of the material to be refined, received by way of said inlet and passing therefrom to the space between the opposed refining surfaces, and said infeed disc being connected to and driven by a shaft, infeed apparatus comprising means connecting to the inlet of the disc refiner defining a channel aligning with the inlet and accommodating the projection therethrough of said drive shaft, continuous blade means connecting with and projected from said shaft at the end of the shaft immediately preceding the face of said infeed disc and control means positioned within said channel at the outer peripheral limit of said blade means to direct material moved by said blade means to enter the related disc refiner and said delivery passage of its infeed disc in an area substantially coinciding with a predetermined position of the delivery passage during rotation of said infeed disc.

4,223,848

REEL CHANGEOVER APPARATUS FOR HIGH SPEED STRAND TAKEUP MACHINES

Bruce M. Brokke, Maricopa County, and Charles E. Sprain, Yavapai County, both of Ariz., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,412
Int. Cl.[3] B65H 54/02, 67/04
U.S. Cl. 242—25 A 4 Claims



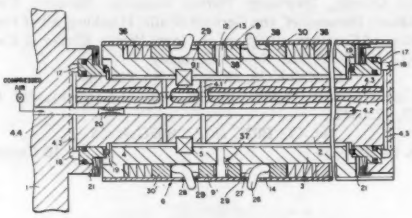
1. In a high speed strand takeup machine having means for supporting and for rotating a pair of reels side-by-side about mutually parallel and adjacent reel axes, reel changeover apparatus for transferring the feed strand from one reel to another which comprises, in combination, a distributor through which strand material may be fed onto the reels mounted for movement between a plurality of positions over and to each side of reel axes; a pair of snaggers; means for rotating said snaggers about the parallel reel axes in mutually spaced orbits lying in a common snagger orbits plane; and a strand deflector having a hook coupled with drive means for moving said hook along a path extending between the reel axes and traversing said common snagger orbits plane at a point below the reel axes with the path having a beginning point and an ending point, and wherein said deflector drive means further includes means for returning said hook from said path ending point to said path beginning point along a return path extending above said path and reel axes.

4,223,849

CHUCKING SPINDLE FOR THE RECEPTION OF A BOBBIN CARRIER

Heinz Schippers, and Erich Lenk, both of Remscheid, Fed. Rep. of Germany, assignors to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Remscheid-Lennep, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 902,386, May 3, 1978, Pat. No. 4,175,712. This application Jul. 30, 1979, Ser. No. 61,747
Claims priority, application Fed. Rep. of Germany, May 4, 1977, 2719853; Switzerland, Apr. 17, 1978, 4087/78; Fed. Rep. of Germany, Dec. 18, 1978, 2854715
Int. Cl.[3] B65H 54/54, 54/74
U.S. Cl. 242—46.4 22 Claims



1. In a clamping chuck on a thread-winding machine for the reception of a removable bobbin carrier wherein said chuck includes a chucking spindle turnably borne on an arm extending from the machine frame, a cylindrical mantle sleeve mounted concentrically about said spindle and having an inner diameter greater than an outer diameter of said spindle over a substantial portion of the total length of the chuck so as to define at least one annular cylindrical interspace between said sleeve and said spindle at a selected axial position along the chuck, and a plurality of clamping elements situated within said interspace and radially supported by the spindle with openings in said mantle sleeve for the radial passage therethrough of each clamping element, the improvement which comprises:

elongated clamping elements arranged in said interspace between said spindle and said mantle sleeve to swing freely in an axial plane of the chuck, each clamping element having an outer clamping end which is movable radially of its sleeve opening between an extended position for gripping the bobbin carrier and a retracted position for releasing the bobbin carrier, an inner thrust end free to slide while supported by the spindle and a force directing slide cam edge between said outer clamping end and said inner thrust end, said cam edge being in sliding contact along an opposing slide surface within the sleeve and spindle combination so as to provide a radially directed component of force;

means to exert two forces on each clamping element to cause

a swinging movement into its extended clamping position, one force being applied in the area of said thrust end and the other force being applied in the area of the slide cam edge, each of said two forces being directed axially parallel of the chuck and opposite to one another and at a radially spaced distance from one another so that the two forces on the clamping element combine to exert a torque acting in the axial plane so as to swing the clamping element into its radially extended clamping position; and

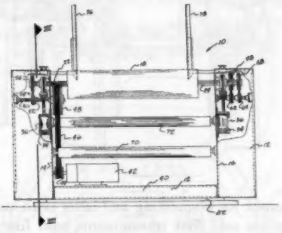
means to counteract said two forces to return each of said clamping elements to its retracted position.

4,223,850

SURFACE WIND BATCHER AND METHOD OF COLLECTING MATERIAL IN ROLL FORM

William J. Alexander, III, 41 W. Golden Strip Dr., Mauldin, S.C. 29662

Filed Feb. 28, 1979, Ser. No. 15,885
Int. Cl.³ B65H *17/08*
U.S. Cl. 242—66 **14 Claims**



1. A surface wind batcher for collecting an indefinite length web of material in roll form comprising a support frame, a pair of side by side, spaced, parallel support rollers having support shaft means and being mounted on said frame for engaging spaced undersurface portions of a roll of material across the full width thereof to support the roll therebetween, drive means for rotating each of the support rollers to impart rotation to the roll of material through surface engagement with the roll to build the diameter thereof; and roller adjusting means including fluid actuated piston means mounted on said frame at each end of said rollers, bearing means attached to each of said piston means for movement thereby, each of said bearing means supportably engaging a respective end portion of said shaft means of said roller to permit rotation of said shaft means therein, and to move said rollers in rectilinear directions to increase or decrease the distance between the rollers and maintain positional stability of the roll on the rollers.

4,223,851

CARPET TUBE DISPENSER

Michael A. Lewallyn, P.O. Box 1361, Dalton, Ga. 30720

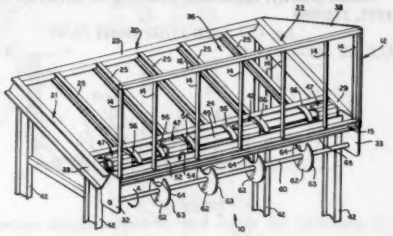
Filed Apr. 26, 1979, Ser. No. 33,689
Int. Cl.³ B65H *17/08*
U.S. Cl. 242—66 **5 Claims**

1. Apparatus for dispensing elongated tubes to be used in a carpet roll-up machine, comprising:

a hopper for holding a plurality of elongated tubes therein, said hopper including at least one sloped wall and defining at the lower end portion of said sloped wall an elongated, horizontally oriented outlet opening through which the tubes can leave said hopper one tube at a time;

agitation means including protrusions movable upwardly through said sloped wall at a level above said outlet opening and in a direction away from said outlet opening for agitating the tubes within the hopper and aligning one tube at a time within said outlet opening; and

a tube collecting and dispensing means for collection one tube at a time from said outlet opening and dispensing the tubes one at a time, said collecting means positioned below said outlet opening of said hopper and comprising a plurality of disc elements each mounted in spaced axial alignment with one another on a rotatable bar and each disc element defining a peripheral groove in alignment with



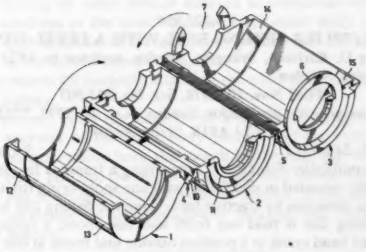
the grooves of the other discs and arranged to rotate with said bar between positions where the grooves are located beneath said outlet opening for receiving a tube from the outlet opening and a position where the grooves face downwardly for dispensing a tube therefrom.

4,223,852

ROLL FILM CARTRIDGE

Arnold Neuhold, Farchant, Fed. Rep. of Germany, assignor to Geimuplast Peter Mundt GmbH & Co. KG, Farchant, Fed. Rep. of Germany

Filed Feb. 2, 1979, Ser. No. 9,173
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1978, 2804985
Int. Cl.³ G03B *17/26*
U.S. Cl. 242—71.1 **5 Claims**



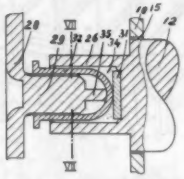
1. A roll film cartridge comprising a central substantially semicylindrical member, a pair of outer substantially semicylindrical members, hinge means connecting said outer members to opposite longitudinal edges of said central member respectively, and means for interconnecting said central member and one of said outer members together to form a substantially cylindrical shell for enclosing a roll film and for connecting the other of said outer members around said shell to form a cover defining in conjunction with said shell an arcuate film passage and a film exit slot.

4,223,853

DEVICE FOR ROLLING ON AND OFF SAFETY BELTS, ESPECIALLY OF MOTOR VEHICLES

Hans-Hellmut Ernst, Sülfeld, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed May 10, 1978, Ser. No. 904,507
Claims priority, application Fed. Rep. of Germany, May 10, 1977, 2720959
Int. Cl.[3] A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.4 R 3 Claims



1. A device for rolling a safety belt on and off, especially for use in motor and air vehicles, which includes in combination: a housing, a shaft rotatably double journalled differently within said housing during normal operation than blocking operation; a safety belt connected to said shaft and adapted to be wound onto said shaft; spring means continuously urging said shaft in the belt winding-up direction, said safety belt being adapted in response to a pull exerted thereupon to be wound off said shaft against the thrust of said spring; first bearing means axially disposed with respect to said shaft; second bearing means on said housing and in radial spaced relation with said shaft, wherein said first bearing means journals said shaft in the axial direction and radial direction when radial forces are relatively small during normal operation of said belt and wherein the second bearing means absorbs radial forces by direct support of said shaft on said housing during blocking of said shaft; said first bearing means including sleeves projecting from opposite ends of the shaft, each sleeve having an axial bearing surface at the end thereof and shaft-like extensions projecting from the housing in axial alignment with the shaft and sleeves, said shaft-like extensions being received in the sleeves; said first bearing means also including cup-like bushings disposed over the shaft-like extensions and within said sleeves, the cup-like extensions having spherical crowned bottom surfaces which abut the bearing surfaces in the sleeves to provide an axial journal.

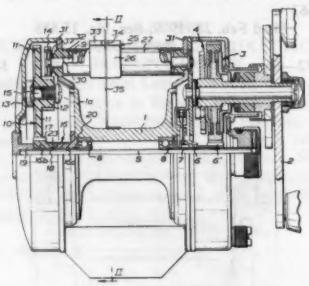
4,223,854

MULTIPLIER FISHING REEL WITH A LEVEL-WIND

Jarding U. Karlsson, Svängsta, Sweden, assignor to ABU Aktiebolag, Sweden

Filed Nov. 20, 1978, Ser. No. 961,907
Claims priority, application Sweden, Nov. 28, 1977, 7713420
Int. Cl.[3] A01K *89/02, 89/04*
U.S. Cl. 242—213 9 Claims

1. A multiplier fishing reel comprising a frame, a line spool rotatably mounted in said frame, said line spool being rotatable in a first direction by tractive force from the fishing line when the fishing line is paid out from said line spool, a rotatably mounted hand crank in a position outside said frame at one side of said line spool, and first transmission means (**3, 4, 6**) between said crank and said line spool at said one side thereof for rotating said line spool in the opposite direction for retrieval of the fishing line onto said spool, a level wind mechanism (**9, 25**) for laying the line on said line spool during retrieval of the line, second transmission means (**17, 10, 14**) between said line spool at the other side thereof and said level wind mechanism for driving the latter via said line spool when said line spool is rotated by means of said crank, first clutch means (**6**) in the form of a disengageable clutch means between said first transmission and said line spool for disengaging said line spool from said hand crank when a cast is to be effected, second clutch means (**3**) in the form of an adjustable frictional clutch means in said first transmission means for permitting rotation of said line spool in relation to said crank in said first direction by an essential tractive force from the fishing line, such as when a fish taking the bait rushes, and an automatically engageable and disengageable third clutch means (**16, 40**), said third clutch means being independent in relation to said first and second clutch means included in said second transmission means at said other side of said line spool and including cooperating first and second rotatable clutch members, said first clutch member being connected to be rotated by said line spool and said second clutch member being connected to said level wind mechanism, said first and second clutch members being adapted to be connected to each other only when said line spool is driven by



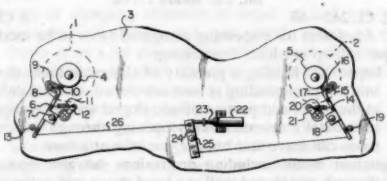
said hand crank for connecting said latter with said level wind mechanism via said first transmission, said first and second clutch means, said line spool and said third clutch means; said first and second clutch members of said third clutch means (**16, 40**) being arranged to be disengaged in relation to each other automatically when said line spool is rotated by tractive force from the fishing line, whereby said level wind mechanism, when said first clutch means is engaged and said line spool is rotated by means of said hand crank, is driven in a normal way through said line spool, whereas said line spool, when said first clutch means is disengaged, is rotatable by the fishing line substantially without transmitting driving force to either said level wind mechanism or to said hand crank, both of which may then be stationary.

4,223,855

BRAKING SYSTEM FOR REEL-TO-REEL TAPE TRANSPORT

Juozas Briedis, Chicago, assignor to Pentagon Industries, Inc., Chicago, Ill.

Continuation-in-part of Ser. No. 865,562, Dec. 29, 1977, abandoned. This application Oct. 3, 1978, Ser. No. 948,249
Int. Cl.[3] B11B *15/32*; G03B *1/04*
U.S. Cl. 242—204 13 Claims



1. A compound electro-mechanical braking and holding system for a magnetic tape transport which includes conventional A.C. supply and take-up reel motors, said braking system comprising:

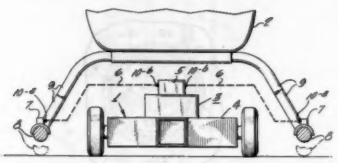
(A) motion sensing means for differentiating between motion and lack of motion of said transport;
(B) dynamic braking means for applying braking currents to both of said motors only when both a stop mode of operation has been instituted and motion of said tape transport is sensed;
(C) mechanical braking means for holding each of said reel motors whenever both a stop mode of operation has been instituted and motion of said tape transport is not sensed; and
(D) control means responsive to the institution of a stop mode of operation and to said motion sensing means for activating said dynamic braking means when both a stop mode of operation has been instituted and when motion of said tape transport is sensed and for subsequently deactivating said dynamic braking means and activating said mechanical braking means when motion of said tape transport is not sensed.

4,223,856

HELICOPTER GROUND HANDLING EQUIPMENT

Gary A. DiVincenzo, Westchester, Pa., assignor to Rorer Group, Inc., Fort Washington, Pa.

Filed Oct. 27, 1978, Ser. No. 955,509
Int. Cl.² B64C 25/32; B64F 1/22
U.S. Cl. 244—50 **5 Claims**



1. Helicopter ground handling equipment comprising adjustable load carrying means universally adapted for attachment to existing wheel attachment points on helicopters equipped with skid-type landing gear having fixed wheel attachment fittings; said ajustable load carrying means comprising a yoke assembly having a center section of adjustable length, left and right adapters, each adapter having on one side thereof a fitting adapted to mate with the existing wheel attachment fitting on the corresponding helicopter skid, and on the other side thereof, coupling means to couple said adapter to the ends of said adjustable center section having mating coupling means thereon; said yoke assembly providing a support by which the helicopter can be lifted by an upward force from a mobile lifting dolly engaging the yoke assembly and elevating the helicopter off the ground with substantially the entire weight of the helicopter borne by said yoke assembly being vertically aligned with the center of gravity of the helicopter thereby enabling the helicopter to be lifted and transported by movement of the mobile lifting dolly without any wheels attached directly to the skids.

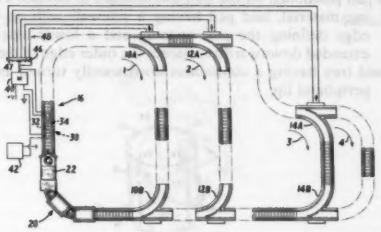
4,223,857

SWITCHING ARRANGEMENT FOR MODEL TRAINS

Said S. Hussein, 2814 Kennedy Blvd., Jersey City, N.J. 07306

Filed May 24, 1979, Ser. No. 42,019
Int. Cl.² B61L 11/08
U.S. Cl. 246—231 **10 Claims**

1. An automatic track switching arrangement for model railroads comprising:
a set of tracks arranged in multiple closed paths which have at least one track section in common;
remote controlled track switches being provided at the intersections of the multiple closed paths;
a signaling device located, at least in part, along the common track section and being actuated by passage of at least one car of a model railroad train, said device being actuated for a period related to the time at least a portion of the car is in proximity to said signaling device;
a motor operated by said signaling device; and



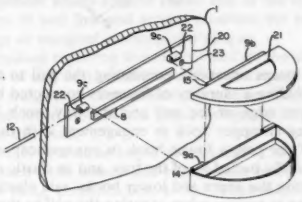
a selection means moved by said motor for switching selected ones of said track switches based on the position of said selection means as determined by said motor.

4,223,858

BAG HOLDER

Gerardo P. de Salazar, Bosque de las Catarinas No. 28 Bosques de la Herradura, Mexico

Filed Apr. 27, 1978, Ser. No. 900,740
Int. Cl.² B65B 67/04
U.S. Cl. 248—101 **13 Claims**



1. A bag holder comprising:
(a) an outer body portion provided with an aperture and thereby having an inner and outer surface,
(b) an inner body portion provided with a passageway and having an outer surface adapted to cooperate with and conform to the inner surface of the outer body portion upon insertion of the inner body portion into the aperture of the outer body portion, and
(c) means for hingedly attaching the outer body portion to a surface,
whereby, upon the insertion of a mouth of a bag into the aperture of the outer body portion and the inner body portion within both the mouth of the bag and the outer body portion, the bag is supported with the mouth of the bag in an open position with an interior of the bag being accessible by the passageway through the inner body portion.

4,223,859

PAIL AND WORK STAND ASSEMBLY

Elwyn J. Erickson, 210 Sixth Ave. NW., Wells, Minn. 56097

Filed Jul. 12, 1978, Ser. No. 923,822
Int. Cl.² A47G 23/02
U.S. Cl. 248—154 **10 Claims**

1. A pail and work stand assembly to position a pail for containing building material at a relatively elevated location, comprising:
a work stand having a supportive base;

said work stand including column means having an upper end and a lower end, said lower end connected to the base;

a tray connected to the upper end of the column means to be positioned at a relatively elevated location;

a pail positioned on the tray and adapted to contain a building material, said pail having a sidewall with an upper edge defining the pail opening and a lower side edge extended downwardly adjacent the outer edge of the tray;

said tray having a continuous downwardly turned annular peripheral lip;

fastening means releasably connecting the pail to the tray and including a plurality of fasteners connected between the upper edge of the pail and the tray, each fastener including an upper hook in engagement with the upper edge of the pail, a lower hook in engagement with the downwardly turned lip of the tray, and an elastic member connecting the upper and lower hooks, said elastic member being in tension when securing the pail to the tray.

4,223,860

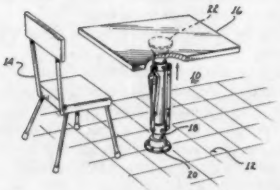
CONVERTIBLE STAND FOR TABLE TOPS

John D. Prest, 1313 6th Ave., Yuma, Ariz. 85364

Filed Jan. 5, 1979, Ser. No. 1,197

Int. Cl.[2] F16M *11/38*

U.S. Cl. 248—171 **15 Claims**



1. A multi use stand for supporting table tops, said stand comprising in combination:

(a) a length of tubing, said tubing having an upper end for engaging and supporting the table top and a lower end for engaging a floor mounted member;

(b) first collar means for circumscribing said tubing, said first collar means being disposed a sufficient distance from the lower end of said tubing to allow the lower end to engage the floor mounted member;

(c) at least three legs;

(d) means for pivotally attaching each of said legs to said first collar means to allow extension of said legs radially from said tubing;

(e) second collar means for circumscribing said tubing, said second collar means being disposed a sufficient distance from the upper end of said tubing to allow the upper end to engage the table top;

(f) at least three links;

(g) means for pivotally securing each of said links to said second collar means; and

(h) further means for pivotally securing each of said links to one of said legs;

whereby, angular reorientation of said links in a plane radial to the tubing pivotally extends or retracts said legs with respect to said tubing to provide either a three legged stand for supporting the table top upon a surface or a stand for supporting the table top upon the floor mounted member, respectively.

4,223,861

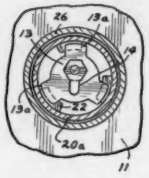
ADJUSTABLE HANGER FOR ELONGATED WALL MOUNTED MEMBERS

Kenneth F. Guggemos, and Arthur R. Guggemos, both of Winsted, Minn., assignors to Sterner Lighting Systems Incorporated, Winsted, Minn.

Filed Dec. 2, 1977, Ser. No. 856,910

Int. Cl.[2] F16M *13/00*

U.S. Cl. 248—222.3 **17 Claims**



1. In combination with an elongated member and a support wall or other supporting structure, apparatus for mounting the elongated member on the wall comprising a support member having a first end portion and an opposite second end portion, means for clamping the first end portion to the wall in various selected adjusted positions relative the wall in directions at right angles relative to one another in the plane of the wall, a mounting bolt mounted by the second end portion to extend outwardly thereof in a direction away from the first end portion, and a spacer sleeve abutting against the wall and the elongated member to have the support member extend thereinto and to space the elongated member the desired distance from the wall, the spacer sleeve being of a greater length than the spacing of said end portions.

4,223,862

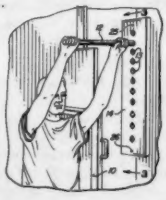
PATIENT SUPPORT APPARATUS

Val J. Doughty, P.O. Box 26075, Tempe, Ariz. 85282

Filed Nov. 20, 1978, Ser. No. 961,984

Int. Cl.[3] A47B *96/06*

U.S. Cl. 248—222.3 **9 Claims**



1. A patient support apparatus including in combination:

an elongated anchor member for attachment to a wall, said member having a predetermined thickness and having a predetermined number of apertures substantially normal to the surface thereof and extending a predetermined depth therein for receiving a support bar, the walls of said apertures being substantially normal to the surface of said member; and

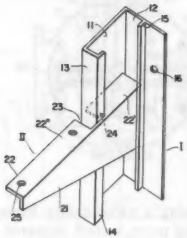
an elongated support bar for insertion into said apertures to extend outwardly from said anchor member and having external dimensions to matingly and removably fit into such apertures, said predetermined depth of said apertures being sufficient to cause said support bar to bear against the wall of the aperture into which it is inserted to provide stable support to patients applying weight to said bar in a plane normal to the axis of said support bar.

4,223,863

SHELF SUPPORTS

Josef Birman, 81a Acco Rd., Kiryat Motzkin, Israel

Filed Sep. 28, 1978, Ser. No. 946,730
Int. Cl.[2] A47G *29/02*
U.S. Cl. 248—246 **6 Claims**



1. A shelf support structure consisting of vertical members adapted to be fastened to a wall or another vertical structure, and of brackets adapted to be moved along the vertical members and to be held therein by frictional locking forces, wherein

each vertical member has a uniform cross section in the shape of a rectangular, asymmetrical channel comprising a web, a larger-width flange and an outer, smaller-width flange provided along its outer edge with a re-entrant first guide ridge parallel to the plane of the web, a second guide ridge being provided on the inside of the base flange facing the first guide ridge, but at a greater distance from the web than the first guide ridge, the web, the two guide ridges and the respective portions of the flange between the web and the guide ridges defining the inner space of the vertical member,

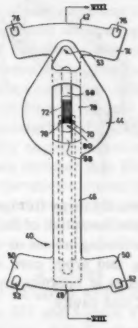
each bracket is in the shape of a rigid angle plate having an inner end and an outer end, the inner end of which is positioned in a vertical member with its axis perpendicular to the plane of the base flange, and comprises a vertical side plate of a height smaller than the bracket length which side plate is positioned outside and adjacent to the first guide ridge parallel to the plane of the web, and at its inner end adjacent to the inner-space face of the second guide ridge, and a horizontal top plate of a width commensurate with the width of the outer flange, extending from the top of the side plate in the direction of the channel web, said topplate being divided by a cross-wise extending cut-out into an inner portion corresponding in shape and size to the inner space of the vertical member and into an outer portion distanced from the outer channel flange by a gap sufficient to allow tilting of the bracket in its vertical plane for the sidewise insertion of the inner portion into the inner space of the vertical member.

4,223,864

PLAQUE DISPLAYING DEVICES

John M. Harlow, 14 Chestnut Way, Derby DE6 6FQ, England

Filed Feb. 21, 1978, Ser. No. 879,600
Int. Cl.[3] A47G *1/16*
U.S. Cl. 248—490 **4 Claims**



1. A plaque displaying device comprising:

first and second members, each of said members having an elongate portion;

mounting means provided on one of said members;

engagement means located at one end of the elongate portions of said first and second members for engaging the edge or marginal portions of a plaque;

longitudinal receiving means provided on the elongate portion of said first member which at least partially receives the elongate portion of said second member;

a longitudinal slot located in the elongate portion of one of said members;

a plurality of teeth arranged on each side of said slot, the face of each tooth nearest said engagement means of said member being perpendicular to the longitudinal axis of said member;

a resiliently mounted projection provided on said other member which bridges said slot and which is engageable with any of said teeth, said projection having a right triangular transverse cross-section with the face of said projection nearest said engagement means of said other member being perpendicular to the longitudinal axis of said other member;

such that said engagement means of each member are easily moved toward each other as said first member receives said second member until a plaque is thus held between said engagement means, and the moving apart of said engagement means is prevented by the abutment of the perpendicular faces of said teeth and said projection unless said projection is depressed through said slot lifting said projection clear of said teeth.

4,223,865

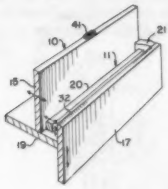
MOLDING ASSEMBLY FOR FORMING WINDING ARBORS

Salomon S. Flores, 2046 N. Kedvale, Chicago, Ill. 60639

Division of Ser. No. 779,309, Mar. 21, 1977, Pat. No. 4,131,242, which is a continuation-in-part of Ser. No. 719,404, Sep. 1, 1976, abandoned. This application Aug. 18, 1978, Ser. No. 934,869
Int. Cl.[3] B29C *1/14*
U.S. Cl. 249—144 **1 Claim**

1. A molding assembly for forming winding arbors of varying sizes comprising a cavity with adjustable dimensions, said cavity including first and second substantially vertical plates, and a substantially horizontal plate, said first vertical plate being sealingly mounted to said horizontal plate for lateral movement relative to said horizontal plate for adjusting the

width of said arbor, said second vertical plate being sealingly mounted on an end of said horizontal plate for vertical movement relative to said horizontal plate for adjusting the thickness of said arbor, said second vertical plate being equal or lower in height than the first vertical plate and having an upper



surface angled downwardly away from said first vertical plate for the prevention of the formation of flashing on said winding arbor, arbor core positioning means at opposite ends of said cavity for positioning said arbor core in the center of said cavity and sealing means at opposite ends of said cavity for defining the length of said cavity.

4,223,866

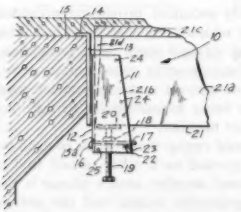
ADJUSTABLE BRACKET

Noel S. Black, Hydro, Okla., assignor to Brown Company, Pasadena, Calif.

Continuation-in-part of Ser. No. 681,155, Apr. 28, 1976, abandoned. This application May 10, 1977, Ser. No. 795,648

Int. Cl.³ E04G *17/18*

U.S. Cl. 249—211 **12 Claims**



1. An adjustable bracket for being depended from a beam and for being used in pairs as joist hangers, comprising:

wall means including a pair of spaced-apart side walls connected to and extending in parallel from a rear wall, there being no top wall so as to permit a joist to be placed from above and/or to extend above the side walls when positioned and held between the side walls;

an L-shaped element affixed to the rear wall and adapted for depending the bracket from a beam;

first means disposed between the side walls adapted for supporting and positioning the joist in a particular position when received within the bracket and holding the bottom of the joist between the side walls; and

second means removably connected to the wall means for positioning and holding the first means between the side walls in a vertically adjustable position and for removing the first means from between the side walls upon being removed from the wall means to permit dropout of a supported joist.

4,223,867

VALVE WITH A PAIR OF VALVE PLATES

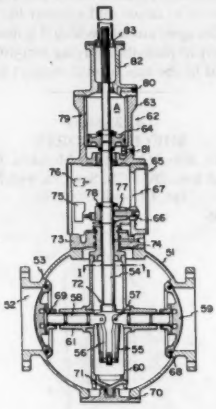
Yasukazu Niino, Kitakyushu, and Takuya Nagai, Nogata, both of Japan, assignors to Nishinippon Engineering Co., Ltd., Fukuoka, Japan

Division of Ser. No. 747,499, Sep. 28, 1976, Pat. No. 4,106,748. This application Nov. 7, 1977, Ser. No. 849,043

Claims priority, application Japan, Aug. 25, 1976, 51-14218; Aug. 25, 1976, 51-114219

Int. Cl.² F16K *31/143*

U.S. Cl. 251—62 **1 Claim**



1. A valve comprising a valve casing having two axially aligned communicating ports, a shaft mounted on said valve casing and having its axis disposed generally perpendicular to the axis of said axially aligned communicating ports, a cylinder mechanism mounted on said valve casing for reciprocating said valve shaft, said cylinder mechanism comprising a frame structure on said valve casing and cylinder means mounted on said frame structure, said cylinder means comprising an operating cylinder and a piston mounted on said valve shaft and operable in said cylinder, said cylinder mechanism further comprising means defining a slot in said frame structure and engageable means operably connected to said valve shaft and having an engageable member engageable in said slot such that said engageable member is displaceable along said slot as the valve shaft is reciprocated by said cylinder means, at least a portion of said slot being disposed so as to effect rotation of said valve shaft as the engageable member engages said slot during at least a portion of the reciprocable movement of said valve shaft, a shifter casing disposed in said valve casing, said shifter casing having a first portion disposed generally coaxial with the axis of said valve shaft and a second portion disposed generally perpendicular to the axis of said valve shaft, said valve shaft being reciprocably mounted in said first portion, said second portion comprising rod support bodies, a pair of valve plates disposed in said valve casing for closing said communicating ports, valve rods connected generally centrally to said valve plates and reciprocably mounted in said rod support bodies such that reciprocation of said valve rods in said support bodies effects reciprocation of said valve plates, said rod support bodies and said valve rods having longitudinal axes coincident with said aligned axis of said two communicating ports, operable means airtightly and watertightly disposed within said shifter casing operably connecting said valve shaft and said valve rods to transmit said reciprocable movement of said valve shaft to said valve rods, said operable means comprising a shifter element disposed in said shifter casing, said shifter element being mounted on said valve shaft and having means defining slots, said valve rods having pins disposed within said slots to provide a positive mechanical connection

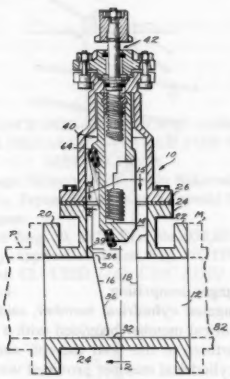
between said valve rods and said shifter element such that reciprocable movement in each direction of said valve shaft effects a corresponding reciprocable movement of said valve rods in either axial direction thereof, whereby upon reciprocation of said valve shaft by said cylinder mechanism, said operable means is operable to displace said valve plates relative to the respective communicating ports and said engageable means engaged in the first said slot is operable to effect rotation of said valve plates about the axis of said valve shaft.

4,223,868

RESILIENT SEATED GATE VALVE

Dennis W. Humes, and Joseph L. Daghe, both of Decatur, Ill., assignors to Mueller Co., Decatur, Ill.

Filed Apr. 10, 1979, Ser. No. 28,918
Int. Cl.³ F16K *3/314, 3/12*
U.S. Cl. 251—326 **11 Claims**



1. A gate valve structure for use in mains carrying a fluid, said gate valve structure comprising:

a valve casing having a through-bore for the flow of fluid, an elongated chamber intersecting said through-bore intermediate its ends and defining inlet and outlet ports to the chamber, and a valve seat in said casing surrounding one of said ports, said valve seat lying generally in a plane which converges at an acute angle to a plane normal to the axis of the through-bore, said valve seat further having an upper arcuate planar portion facing toward the other of said ports to define a face-seat surface having an outer arcuate edge, the face-seat surface having a maximum radial thickness intermediate the ends of said arcuate edge and progressively reducing in radial thickness to a minimum radial thickness adjacent the ends of said outer arcuate edge, a bottom arcuate portion forming a smooth and uninterrupted portion of said through-bore to define an edge-seat surface, and a smooth transition portion between each end of said upper arcuate planar portion and each end of said bottom arcuate portion to define a combination face-edge-seat surface;

a generally flat gate member reciprocal in said elongated chamber from a closed position across said through-bore and seating against said valve seat to an open position out of said through-bore, said gate member including a body member having an annular planar surface lying in a plane generally parallel to the plane of said valve seat, an annular resilient seal member supported on said planar surface of said body member, said annular seal member being generally rectangular in radial section and having an arcuate upper bulbous portion extending axially therefrom for engaging the upper portion of said valve seat to form a face seal therewith, said arcuate bulbous portion of said seal member, when relaxed, having a maximum axial thickness adjacent its upper portion in a plane extending through an axis of movement of said gate member, said annular resilient seal further having a bottom arcuate portion of uniform minimum axial thickness for engaging said bottom arcuate portion of said valve seat to form an edge seal therewith, said arcuate upper bulbous portion merging into said bottom arcuate portion of said seal member to form intermediate portions for engaging each transition portion of said valve seat to form a combination face-edge seal, and said arcuate upper bulbous portion having a pair of oppositely disposed axially extending arcuate bulges thereon at positions to engage said face-seat surface adjacent the ends of the outer arcuate edge where said face-seat surface has a reduced radial thickness, said bulges having a greater radial thickness than the face-seat surface where they engage to provide increased contact area when the gate member is in the closed position; and

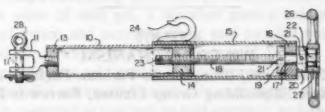
valve stem means operatively connected to said gate member and extending through said casing for moving said gate member between the closed and open positions.

4,223,869

LOAD BINDER APPARATUS

William W. Patterson, III, and Eugene F. Grapes, both c/o W. W. Patterson Company, 830 Brocket St., Pittsburgh, Pa. 15233

Continuation-in-part of Ser. No. 864,690, Dec. 27, 1977, Pat. No. 4,131,264, which is a continuation-in-part of Ser. No. 805,185, Jun. 9, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,452
Int. Cl.³ B66F *3/08*
U.S. Cl. 24—68 CD **8 Claims**



1. A load binder and lashing tightener apparatus comprising a first inner elongate sleeve member closed at one end, an anchor adjacent said closed end, a threaded nut fixed in the other end of said first sleeve, a second outer sleeve having one end adapted to telescope over the first inner sleeve in close fitting relationship, anchor means on said second sleeve adjacent said one end, screw means extending through the second sleeve, one end threadingly engaging the nut in said first sleeve, the other end rotatably fixed in the said other end of said second sleeve and hand wheel drive means on said other end for rotating said screw whereby said second sleeve is caused to telescope over the first sleeve and the anchor means on said sleeves are brought together, said sleeves being freely rotatable relative to one another, said hand wheel having a diameter and the anchor means being arranged on said sleeves such that the periphery of the wheel lies below a line through the center of the two anchor means in all positions of said anchor means, said sleeves being freely rotatable relative to one another, and wherein the sleeves are of cylindrical form having said anchor means on each of said sleeves, whereby said anchor means are free to align themselves to provide maximum pull through the binder.

4,223,870

BAILER FOR TOP HEAD DRIVE ROTARY WELL DRILLS

Lynn Bartholomew, Rte. 4, Box 326, Spokane, Wash. 99204

Filed Apr. 26, 1979, Ser. No. 33,548
Int. Cl.³ B66C *23/60*
U.S. Cl. 254—334 **8 Claims**

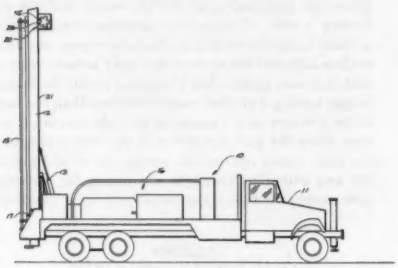
1. In a portable top head drive rotary drill rig having a

derrick and a source of hydraulic fluid under pressure, a bailer device, comprising:

a drum bracket mounted to the derrick;

a bailer drum rotatably mounted to the bracket for rotation about an axis transverse to the derrick;

a positive displacement hydraulic motor mounted to the bracket and having a driveshaft connected to the bailer drum;



hydraulic line means for delivering and returning hydraulic fluid between the source and the motor through a delivery line and a return line;

valve means in the line means operable to selectively reverse hydraulic fluid flow in the delivery line and return line to thereby reverse operation of the motor; and

a one way restrictor mounted in the delivery line allowing relatively unrestricted flow of fluid to the motor along the delivery line but restricting flow from the pump when the flow is reversed by operation of the valve means.

4,223,871

WINCH MECHANISM

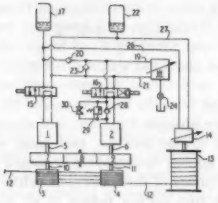
John C. Braithwaite, Broughton-In-Furness, England, assignor to Vickers Shipbuilding Group Limited, Barrow-in-Furness, England

Filed Apr. 3, 1979, Ser. No. 26,675

Claims priority, application United Kingdom, Apr. 4, 1978, 13204/78

Int. Cl.³ B66D *1/48*

U.S. Cl. 254—291 **12 Claims**



1. A winch mechanism comprising:

a rope haulage mechanism;

at least two variable pressure constant displacement hydraulic pump/motors coupled to drive the rope haulage mechanism;

a pump for pumping operating fluid to the hydraulic pump-/motors;

a high pressure fluid supply line connecting the pump to the hydraulic pump/motors;

a fluid return line for returning fluid from the hydraulic pump/motors to the pump;

a fluid accumulator branched from the high pressure fluid supply line;

a first non-return valve in the high pressure fluid supply line between the fluid accumulator and the pump/motors for limiting the flow of fluid from the accumulator to less than the total number of pump/motors; and

a second non-return valve between the high pressure fluid supply line and the fluid return line to permit the motor or motors not connected to the accumulator to act as a pump.

4,223,872

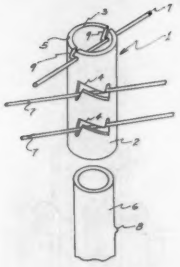
WIRE ENGAGER FOR CHAIN LINK FENCE DEVICE AND METHODS OF MAKING AND USING THE SAME

Leonard Boal, 15455 Old Jamestown Rd., Florissant, Mo. 63034

Filed Mar. 7, 1979, Ser. No. 18,149

Int. Cl.² E04H *17/10*

U.S. Cl. 256—58 **1 Claim**



1. A wire engager comprising,

a hollow elongated cylindrical member, said hollow elongated cylindrical member provided with a plurality of Z shaped apertures in the wall thereof, and said hollow elongated cylindrical member provided with corresponding L shaped apertures in the wall thereof and at one end thereof and communicating with the exterior of such end.

4,223,873

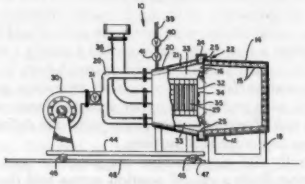
DIRECT FLAME LADLE HEATING METHOD AND APPARATUS

Donald D. Battles, Atlanta, Ga., assignor to The Cadre Corporation, Atlanta, Ga.

Filed Mar. 21, 1979, Ser. No. 22,687

Int. Cl.² C21C *7/00*

U.S. Cl. 266—44 **9 Claims**



1. An apparatus for heating a ladle having an open end comprising:

seal means comprising ceramic fiber compaction material sized and shaped to engage the ladle about its open end and defining an opening therethrough;

a ceramic heat exchanger defining an air inlet path and an exhaust outlet path for communicating through the opening of said seal means with the interior of the ladle;

a fuel burner means connected to said air inlet path for

directing hot combustion gases through the opening of said seal means into the open end of the ladle;

variable fuel supply means for mixing fuel with air from said air inlet path and supplying said mixture to said fuel burner means; and

blower means for moving air along said air inlet path to said burner means;

whereby the seal means forms resilient contact with the open end of the ladle and air from said blower means moves through the heat exchanger, past the fuel supply means, through the fuel burner and through the opening of the seal means and forms a flame to heat the inside surfaces of the ladle and the hot gases from inside the ladle move back through the seal means and through the heat exchanger to preheat the air moving from the blower means through the heat exchanger.

4,223,874

SHAFT FURNACE FOR PRODUCING LOW-OXYGEN IRON-BASE METALLIC POWDER FOR POWDER METALLURGY

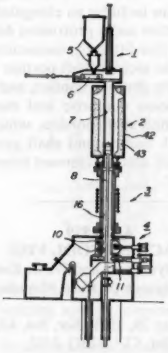
Yoshihiro Kajinaga; Minoru Nitta; Ichio Sakurada, and Shunji Ito, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed Aug. 30, 1978, Ser. No. 938,053

Claims priority, application Japan, Sep. 10, 1977, 52-108354

Int. Cl.³ C22D *1/42*; C22C *33/02*

U.S. Cl. 266—129 **5 Claims**



1. A shaft furnace for producing low-oxygen iron-base metallic powder for powder metallurgy comprising a zone of storing and feeding a raw steel powder, a preheating zone, an induction heating zone and a zone of cutting and cooling a product cake in a vertical array, characterized in that said preheating zone comprises a cylindrical furnace body lined with a refractory, a preheating tube passing through said furnace body at its center in the axial direction and tapered so as to enlarge the inner diameter from the upper end of the tube to the lower end thereof and a space defined between the inner wall of said furnace body and the outer wall of said preheating tube for indirectly heating said raw powder accummulated in the tube by combustion gas, and said induction heating zone comprises a primary coil for excitation repeatedly turned in a spiral form at its outermost part, a secondary coil for heating concentrically disposed inside said primary coil in a sleeve form and an insulating ceramic tube disposed inside said secondary coil through an adiabatic material.

4,223,875

APPARATUS FOR DESKULLING TUNDISHES AND SIMILAR VESSELS

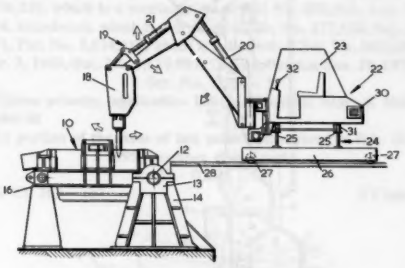
Raymond J. Phillips, Matlock, England, assignor to Alexander Shand Services Limited, Matlock, England

Filed Mar. 5, 1979, Ser. No. 17,670

Claims priority, application United Kingdom, May 30, 1978, 24507/78

Int. Cl.³ F27D *23/02*

U.S. Cl. 266—135 **1 Claim**



1. An apparatus for deskulling and delining tundishes and similar vessels, comprising: a pit for receiving loosened skull brickwork and other rubble, stand means at a first side of said pit to which one end of a tundish is pivotably mounted for tilting loosened skull brickwork and other rubble into the pit, support means for supporting another and opposite end of said tundish during a deskulling operation, parallel rail means along two other sides of said pit, a wheeled gantry bridging the parallel rail means and movable along said parallel rail means above said pit towards and away from said first pit side, a carriage mounted on said gantry for movement therealong in a direction parallel with said first pit side, a slewable and articulated boom mounted at one end on said carriage, and an impact hammer carried at the other end of said boom for effecting the deskulling of a tundish.

4,223,876

APPARATUS FOR DIRECT RECOVERY OF METAL FROM METAL-BEARING ORES

Horst Weigel, and Karl Müller, both of Cologne, Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Wedag AG, Fed. Rep. of Germany

Division of Ser. No. 858,391, Dec. 7, 1977, Pat. No. 4,179,284. This application Feb. 26, 1979, Ser. No. 15,461

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655813

Int. Cl.³ F27B *15/00*

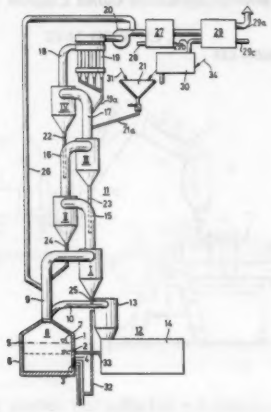
U.S. Cl. 266—156 **9 Claims**

1. An apparatus for direct recovery of metal from relatively fine-grained metal-bearing ores, comprising:

(1) a molten metal bath reactor having a molten metal bath therein, at least one nozzle means located below an upper surface of said metal bath, said nozzle means being connected to a supply of carbon-containing materials and oxygen-containing materials, and a gas collection chamber located within said reactor above the upper surface of said metal bath whereby a CO/H_2-rich reduction gas is generated by said bath from said materials and collected in said chamber;

(2) a multi-stage reduction means comprised of a plurality of cyclone means arranged in a superimposed relation with one another and in operative communication at a lower end thereof with said reactor means and at an upper end thereof with a source of relatively fine-grained metal-bearing ore particles, so that said reduction gas is con-

veyed upwardly through said plurality of cyclone means while substantially simultaneously said ore particles are conveyed downwardly through said plurality of cyclone means so that said particles are sequentially reduced within said cyclone means to such an extent that after a



last of said cyclone means, said particles form reduced ore particles; and

(3) a smelting reactor means in communication with said multi-stage reduction means for receiving said reduced ore particles from said multi-stage reduction means and converting said particles to liquid metal.

4,223,877

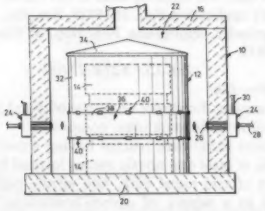
ANNEALING FURNACE

Karl Sanderson, King City, Canada, assignor to Lee Wilson Engineering Company of Canada, Downsview, Canada

Filed Dec. 29, 1978, Ser. No. 974,316

Int. Cl.[3] C21D *9/00*

U.S. Cl. 266—262 **5 Claims**



1. A protective sleeve, for a cover used to enclose metal coils and the like in an annealing furnace having a plurality of fuel burners whereby the coils are protected from the direct flame of the burners, comprising a circumscribing band interposed between the cover and the burners, the band being mounted on the cover and held in spaced relationship therefrom by a spaced pair of bracket means fixed on the cover each in a ring arrangement, the band being threaded between the pair of bracket means and held thereby.

4,223,878

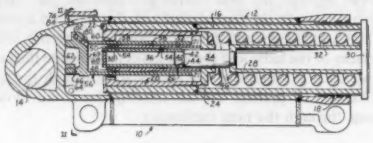
MODULAR RECOIL MECHANISM

Robert L. Isaia, Roanoke; Francis D. Bell, Peoria, and Robert L. Shelby, Chillicoth, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 813,719, Jul. 7, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,619

Int. Cl.[2] B60G *11/56*; B62D *55/30*

U.S. Cl. 267—34 **3 Claims**



1. In a recoil mechanism including a shaft having a movable collar slidably mounted thereon in operative contact with a recoil spring, and fluid chamber defining means operatively associated with the shaft, the improvement comprising the shaft having first and second shaft portions in generally end-to-end, normally abutting contact; the outer surfaces of the first and second shaft portions defining a generally cylindrical overall configuration, with the overall cylindrical configuration of the shaft being substantially smooth, with the first and second shaft portions in abutting contact; the first shaft portion having the collar mounted thereon, the second shaft portion being operatively associated with the fluid chamber defining means, the shaft including means for disengaging the first shaft portion readily and directly axially from the second shaft portion with the second shaft portion remaining in operative association with the fluid chamber defining means; wherein said disengaging means includes an elongated bore defined by said second shaft portion and a protrusion defined by said first shaft portion which free-fittingly, nonsecuringly, and axially fits into the bore of the second shaft portion with the first and second shaft portions in abutting contact; and wherein the fluid chamber defining means comprise seal means in operative contact with the second shaft portion, which seal means remains in contact with said second shaft portion as said first shaft portion is directly axially removed from the second shaft portion.

4,223,879

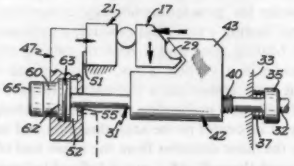
MACHINE TOOL VISE

Ingo E. Wolfe, Brooklyn Park, and W. G. Kuban, Minneapolis, both of Minn., assignors to Kurt Manufacturing Co., Inc., Minneapolis, Minn.

Filed May 29, 1979, Ser. No. 43,007

Int. Cl.[3] B23Q *3/02*

U.S. Cl. 269—32 **4 Claims**



1. A precision machine vise comprising:

an elongate body including an elongate base having a pair of laterally spaced, upstanding slide structures secured thereto and projecting therefrom,

a stationary jaw mounted on said slide structures and having an inner face and an outer face,

a movable jaw mounted on said slide structures for sliding

movement towards and away from the said stationary jaw,

an actuating nut being shiftable relative to said body for moving said movable jaw, interlocking inclined surfaces on said movable jaw and actuating nut whereby the nut imparts a downward component of force on the movable jaw as the latter is urged into gripping relation with a work piece gripped between the jaws,

a cylinder housing secured to one end of said body and having bearing engagement only with the outer face of said stationary jaw and one end of said base, said housing having a cylindrical chamber therein connected in communicating relation with a source of fluid under pressure,

an elongate revolvable actuating screw extending through said body and said cylinder housing and threadedly engaging said actuating nut for shifting the same,

a piston mounted on said screw and positioned in said chamber,

a control valve connected in communicating flow controlling relation with said source of fluid pressure and said cylinder and when operated supplying fluid to the cylinder to axially shift the screw in a forward direction toward said stationary jaw,

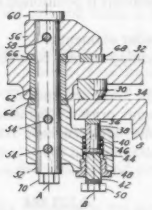
a resilient means engaging the screw and returning the same in a rearward direction when the valve is rendered inoperative.

4,223,880

WORK CLAMP AND PALLET COMBINATION

John H. Brems, 32867 White Oaks Trail, Birmingham, Mich. 48010

Filed Jun. 23, 1978, Ser. No. 918,528
Int. Cl.³ B25B 1/04
U.S. Cl. 269—101 **13 Claims**



1. In a machine tool fixture in which a workpiece is located and clamped, a clamping system comprising:

1. a frame,

2. one or more locator surfaces mounted on said frame positioned for contacting an associated locating surface on said workpiece,

3. one or more reaction surfaces, each associated with one of said locator surfaces and on said frame in a direction away from said workpiece and on an associated line of action substantially perpendicular to and passing through said associated locator surface, and in which a portion of said frame lies between each said reaction surface and said associated locator surface,

4. a deflectable clamping means associated with a locator surface and mounted in said frame through non-rigid support means and comprising:

a. a first pressure means contacting said workpiece on said associated line of action of said associated locator surface,

b. a second pressure means contacting said associated reaction surface, and

c. force means interconnecting said first pressure means and said second pressure means operable to create a relative displacement between said first pressure means and said second pressure means substantially along said associated line of action.

4,223,881

WORKBENCHES

Ronald P. Hickman, Waltham Abbey, England, assignor to Inventec International Limited, Point Robert, Channel Islands

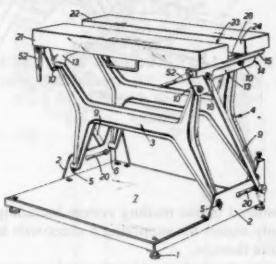
Division of Ser. No. 846,574, Oct. 28, 1977, Pat. No. 4,140,309, which is a division of Ser. No. 642,743, Dec. 22, 1975, Pat. No. 4,076,229, which is a continuation of Ser. No. 495,265, Aug. 7, 1974, abandoned, which is a division of Ser. No. 177,123, Sep. 1, 1971, Pat. No. 3,814,619, which is a division of Ser. No. 803,600, Mar. 3, 1969, Pat. No. 3,615,087. This application Jan. 29, 1979, Ser. No. 7,256

Claims priority, application United Kingdom, Mar. 4, 1968, 10484/68

The portion of the term of this patent subsequent to Feb. 28, 1995, has been disclaimed.

Int. Cl.³ B25B 1/10

U.S. Cl. 269—139 **3 Claims**



1. A portable, collapsible workbench of a size to be carried by hand in a collapsed, compact condition to a site of use by an individual and there folded erect as a rigid, free-standing structure affording a generally horizontal, flat working surface, comprising:

a first laterally elongate vise member;

a second laterally elongate vise member;

said first and second vise members facing each other along laterally elongate edges thereof and having flat upper surfaces, lying in substantially the same plane, which together form the complete working surface of the workbench;

two laterally spaced-apart support members lying generally transversely of the direction of elongation of said vise members and having upwardly facing bearing surfaces;

said first vise member being rigidly connected to said support members to form a rigid U-shaped bench top structure;

means coupling said second vise member to said support members for movement along said bearing surfaces of said support members towards and away from said first vise member and for constraining said second vise member against substantially any movement out of the plane of said upper surfaces;

a pair of laterally spaced-apart transversely-extending vise operating devices having first reaction portions which cooperate with said bench top structure and second reaction portions which cooperate with said second vise member, said vise operating devices being operable in cooperation with said first and second reaction portions to cause said movement of said second vise member along said bearing surfaces; and

collapsible base means, including front laterally spaced-apart legs and rear laterally spaced-apart legs pivotally connected to said bench top structure, for folding between an erect condition, in which said front and rear legs extend

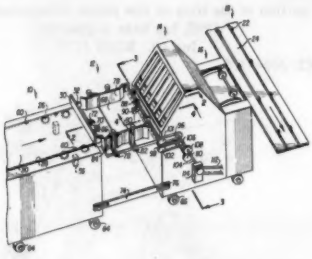
generally downward from said bench top structure and support said bench top working surface in a generally horizontal plane at a convenient working height, and a collapsed condition, in which said front and rear legs extend generally parallel to said working surface in juxtaposition to said bench top structure to form a compact configuration adapted to be carried by hand by an individual.

4,223,882

AUTOMATED IN-LINE MAILING SYSTEM

Lester H. Stocker, Phillipsburg, N.J., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed May 26, 1978, Ser. No. 910,315
Int. Cl.³ B41F *13/56*
U.S. Cl. 270—21 **11 Claims**



1. An automated in-line mailing system including:

a web supply means for supplying a sheet-web having control indicia thereon;

a cutter means attached to said web-supply means for receiving said sheet-web and cutting said sheet-web into individual sheets with a cutting element, said cutter means including a driving means for driving said sheet-web;

an accumulator means for successively receiving individual sheets from said cutter means, successively accumulating individual sheets into sheet piles containing various numbers of individual sheets, and, upon receiving command signals, successively feeding said piles having various numbers of individual sheets into a folding means;

a folding means for receiving sheet piles from said accumulator means and for folding said piles;

a collector means for receiving folded piles of sheets from said folding means, collecting said folded piles of sheets into a group of piles, and thereafter depositing said piles with a receiving means; and

a control system therefor including a scanner for reading said control indicia on said sheet-web, said control system being coupled to said accumulator means for providing said command signals to said accumulator means to eject a pile of individual sheets in response to said scanner reading a control indicia on said sheet web.

10. An asynchronous method of controlling a sheet-web cutter in an in-line system which comprises a cutter which cuts a moving sheet web having indicia thereon into individual sheets and an accumulator means which receives the individual sheets from the sheet-web cutter, collects them to form a group, and processes the sheets of the group, said method comprising the steps of:

transporting the sheet web past said cutter, cutting individual sheets therefrom with said cutter, and transporting said individually-cut sheets from said cutter to said accumulator means;

sensing when said cutter has cut the last sheet of a firstly-cut group of sheets to be collected by said accumulator and, in response thereto, transporting said web an amount corresponding to a first sheet of a secondly-cut group of sheets past said cutter, thereafter inhibiting further transportation and cutting of the first sheet of the secondly-cut group by said cutter until a further processing step is performed on the sheets of the firstly-cut group of sheets; and

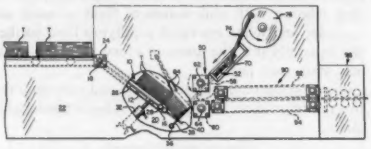
monitoring said firstly-cut group of sheets, and in response to the sensing of said further processing step being performed on them cutting said first sheet of said secondly-cut group with said cutter.

4,223,883

BAG TUBE-FEEDER SYSTEM

Edward C. Dunn, Jr., Bogalusa, La.; Louis S. Hickman, Antioch, Calif., and Thomas D. Penny, Bogalusa, La., assignors to Chase Bag Company, Greenwich, Conn.

Filed Jun. 19, 1978, Ser. No. 917,033
Int. Cl.³ B65H *5/08*
U.S. Cl. 271—11 **1 Claim**



1. A method of serially feeding collapsed bag tubes comprising:

disposing a stack of collapsed bag tubes in an inclined position;

serially removing the topmost tubes from said stack and transporting at least a portion thereof along a unilinear path of motion;

disposing at least two feeder elements so that at least one of said feeder elements is positioned along said linear path of motion;

rotating said feeder elements;

periodically forming a nip between said rotating feeder elements;

engaging the tube being transported with at least one of said rotating elements prior to formation of said nip; and

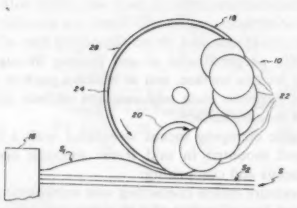
passing said tube between said rotating feeder elements during formation of said nip.

4,223,884

REVERSE BUCKLE SCUFF FEEDER

Bradshaw Burnham, Rochester, and Gary B. Gustafson, Hilton, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 1, 1979, Ser. No. 8,653
Int. Cl.³ B65H *3/06, 3/42*
U.S. Cl. 271—21 **11 Claims**



6. Apparatus for feeding sheets seriatim from a supply stack comprising:

first means mounted for juxtaposition with one of the sheets of said supply stack for frictionally feeding such sheet in a first, sheet feeding, direction;

second means operatively associated with said first means for frictionally urging such sheet in a direction opposite to said first direction;

third means operatively associated with said first means for selectively engaging such sheet and for maintaining such sheet out of frictional contact with said first means when in engagement with such sheet; and

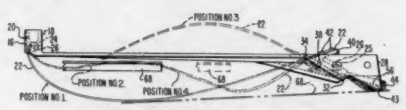
drive means for bringing, in order, said second, first, and third means into engagement with such sheet to first separate and then feed same from said supply stack, and subsequently to facilitate further unimpeded movement of such sheet and prevent a subsequent sheet from being prematurely fed by said first means.

4,223,885

GUIDE ARM ASSEMBLY

William B. Templeton, Howell, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 13, 1978, Ser. No. 959,909
Int. Cl.³ B65H *31/26*
U.S. Cl. 271—220 **9 Claims**



1. Guide arm apparatus providing an entering wall back-up deflecting assembly for use with an item sorter/reader stacker having an entering end and a terminal end portion comprising;

an elongated rigid member having means at opposite ends thereof for pluggably, vertically mounting said rigid member into an item pathway terminal area effective thereby to form a side wall for entering items at a terminal area in an item pathway,

a wave spring member operably connected to said rigid member and being capable of curvilinearly flexing from right to left of the center of said rigid member and return without permanent deformation,

means operably connected to the terminal end of said rigid member preventing reverse deflection of the entering items with respect to the terminal end portion of said rigid member, and

flexible means operably mounted to the terminal end of said rigid member for contact on one side thereof with each item and for contact on the opposite side thereof with an operably associated switch mechanism with which said rigid member is operably associated.

4,223,886

REGISTRATION GATE MECHANISM FOR RECIRCULATING DOCUMENT FEEDER AND DOCUMENT POSITIONER

Walter D. Vogt, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

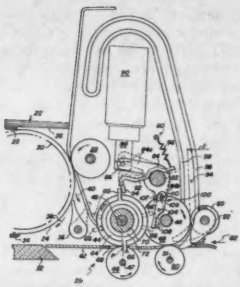
Filed Apr. 16, 1979, Ser. No. 30,482
Int. Cl.³ B65H *9/06*
U.S. Cl. 271—246 **8 Claims**

1. A sheet registration mechanism comprising:

means defining a sheet path;

drive means for moving sheets in first and second opposite directions along said path;

a registration member mounted for movement between (1) a first position in said path for engaging a sheet being moved along said path by said drive means; (2) a second position remote from said path to allow sheets to move in said first direction along said path; and (3) a third position spaced from said first and second positions and remote from said path to allow sheets to move in said second direction along said path; and



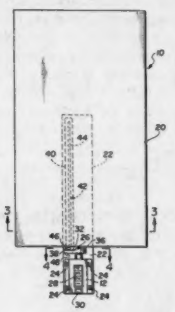
latch means for selectively holding said registration member in said first, second, or third positions.

4,223,887

EXERCISE SUPERVISION DEVICE

Gilbert J. Holtz, 182 Tibbetts Rd., Yonkers, N.Y. 10705

Filed Jul. 27, 1979, Ser. No. 61,290
Int. Cl.³ A63B *23/04*
U.S. Cl. 272—70 **4 Claims**



1. In an exercise supervision device for recording the number of footsteps taken by a jogger while running in place so as to indicate the relative distance effectively traversed by the jogger and including an elongated pad fabricated of resiliently deformable material so that compression of the pad causes the same to exhibit a return urgency in a direction opposite the compression for returning the pad to its initial, non-compressed condition, a rigid plate disposed supportedly atop the pad and defining a simulated jogging surface movable through a linear, substantially vertical reciprocating traverse by alternating compression and return expansion of the underlying pad as the jogger runs in place on the plate, and a counter located adjacent one end of the elongation of the pad and operable for recording and indicating the number of footsteps taken by the jogger and including a counter shaft movable through a rotative traverse for operating the counter such that each rotative traverse of the shaft causes the counter to increment to the next count, means connecting the jogging surface to the counter for converting the linear motion of the rigid plate to the rotative traverse required to operate the counter, said means comprising:

an elongated sleeve positionally fixed between the plate and the underlying pad and extending from the counter end of the pad toward the interior thereof and substantially along

the direction of pad elongation for linear reciprocating movement of said sleeve with corresponding movement of the plate, said sleeve including an opening defined at its end adjacent the counter,

a rigid operating link having a straight portion disposed in said sleeve and a curved portion unitarily connected to said straight portion and extending beyond said sleeve opening and the counter end of the pad,

and a connecting member fixed to the counter shaft for rotation with the shaft and extending radially outward therefrom for relatively movable connection with said operating link curved portion at said radially outward extension of the connecting member so that the connection of said operating link with the counter shaft through said connecting member is radially offset with respect to the shaft axis,

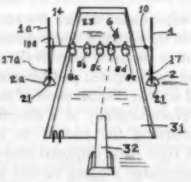
said offset connection of said operating link at its curved portion enabling the accommodation of a lost motion as the substantially vertical linear movement of the rigid plate is converted to a rotative traverse for operating a counter such that when linear substantially vertical movement of the plate occurs, the plate carries said sleeve and said operating link straight portion in the sleeve through corresponding linear movement of said link curved portion moves said connecting member radially outward extension through a pivotal traverse along an arc with respect to and centered about the counter shaft so as to effect a rotative traverse of the shaft and operatively increment the counter, the motion lost as the linearly moving link curved portion moves the connecting member radially outward extension along an arc being taken up by a rotation of said link curved portion at its connection to the connecting member and a corresponding rotation of said link straight portion in and relative to said sleeve whereby said sleeve is effective to maintain the position of said operating link with respect to the pad and overlying plate and prevent lateral displacement of said link between the pad and plate as the linear motion of the plate is converted to the operative rotative traverse of the counter shaft.

4,223,888

GAME FOR SWIMMING POOLS

Robin R. Greene, P.O. Box 881, Reseda, Calif. 91335

Filed Jan. 29, 1979, Ser. No. 7,646
Int. Cl.³ A63B *5/02*
U.S. Cl. 272—103 **4 Claims**



1. A diving game for swimming pools comprised of:

a. a hurdle;

b. releasable means for mounting said hurdle across a swimming pool;

c. two water weighted supports provided with vertical sockets;

d. two vertical standards of a diameter to fit said vertical sockets, each standard containing equally spaced holes along its length;

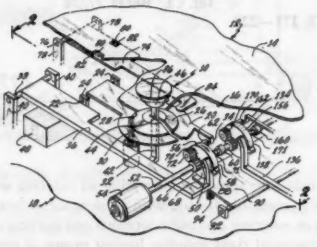
e. two clamp means each fastenable to a respective standard, at least one of said clamp means being a clamp formed into spreadable fingers and a pin at one end and having a pulley at the other, whereby one support and vertical standard are positioned at each side of the pool and said hurdle is formed by passing the ends of a cord through said clamp means and through the pulley in said clamp, fixing each clamp means to its respective standard with said clamp fixed to its standard by inserting said pin into one of the equally spaced holes and then spreading said fingers to fit around the standard at the height of the chosen hole, tightening the cord and tying down its ends, said clamp having holding power against pressure on the cord up to a point where said fingers are forced apart.

4,223,889

BUMPER STRUCTURE INCLUDING DRIVE MECHANISM

Yukio Konta, Gardena, Calif., assignor to Tomy Kogyo Co., Inc., Tokyo, Japan

Filed Oct. 30, 1978, Ser. No. 956,056
Claims priority, application Japan, Aug. 28, 1978, 53-104714
Int. Cl.³ A63F *7/00*
U.S. Cl. 273—127 R **16 Claims**



1. A ball bumper structure which comprises:

a platform having a front and a back,

a first movable member located adjacent to said platform, said first movable member having a first bumper surface exposed at the front of said platform,

a first mounting means for mounting said first movable member relative to said platform so that said first movable member can be moved with respect to the front of said platform,

a first biasing means for biasing said first movable member in a normal position in which said first bumper surface is located so that it can be contacted by a a ball moving along the front of said platform and so that such contact of a ball with said first bumper surface will move said first movable member out of said normal position,

a second movable member located adjacent to said platform, said second movable member having a second bumper surface located so as to be spaced from said first bumper surface,

a second mounting means for mounting said second movable member so that said second movable member can be moved so that said second bumper surface is moved toward said first bumper surface,

a second biasing means for biasing said second movable member in a normal position in which said second bumper surface is spaced from said first bumper surface,

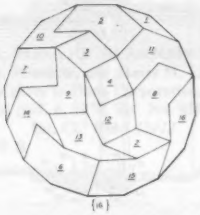
mechanical actuation means for moving said second movable member from its normal position so that said second bumper surface is moved toward said first bumper surface,

said actuation means being operatively associated with said second movable member, and

mechanical latch means for preventing said actuating means from moving said second movable member, said latch means having engaged and disengaged positions, said latch means normally connecting said first movable member and said actuation means, said latch means being disengagable as the result of movement of said first movable member from its normal position so as to allow said actua-

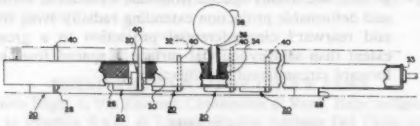
tion means to move said second movable member, said latch means being automatically engagable so as to prevent movement of said second movable member when said first movable member is in its normal position.

4,223,890
SET OF TILES FOR COVERING A SURFACE
Alan H. Schoen, 316 W. Oak St., Carbondale, Ill. 62901
Filed Apr. 30, 1979, Ser. No. 34,245
Int. Cl.[2] A63F *9/10*; B44F *7/00*; F16B *2/00*; B32B *3/10*
U.S. Cl. 273—157 R **3 Claims**



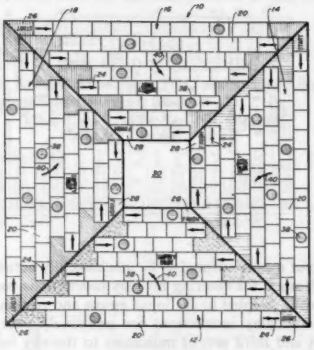
1. A set of tiles for covering a plane surface bounded by a regular polygon of 2n sides, for forming a repeatable cell, and for other purposes, said regular polygon being dissectible into a set of $(n-1)n/2$ rhombuses, comprising one specimen of each distinct rhombus in said set and one specimen of each distinct shape formed by combining two of the remaining rhombuses in said set in such a manner that no two edges at any vertex are collinear.

4,223,891
GOLF STROKE ANALYZER
Richard Van Gaasbeek, Monument Ter. Apts., #4, Hatboro, Pa. 19040, and Robert W. Britton, 241 Surrey Rd., Warminster, Pa. 18974
Filed Aug. 7, 1978, Ser. No. 931,780
Int. Cl.[2] A63B *69/36*
U.S. Cl. 273—186 R **7 Claims**



7. A golf stroke analyzer having pairs of activators located to be physically contacted by a golf club at three different positions of the stroke, with the intermediate position being equidistant from the first and last positions, the path of the stroke between the intermediate and last positions being beyond where contact with a ball would normally be made, whereas the path of the stroke between the first and intermediate position is at least more representative than the foregoing of the stroke at the time of contact with the ball, the two activators of each pair being located one on either side of the center of the path of the stroke of the golf clubhead, in position to physically contact that head toward the respective end thereof but with room for the path of the golf ball in between, comparator means receiving input from such activators for comparing the speed of the stroke in its path between the last two positions with the speed of the stroke in its path including at least one earlier position, and means governed by the comparator means, for indicating whether the average speed of the golf club between the intermediate and last position is greater than that in the path of the stroke between the first and intermediate position.

4,223,892
STATEGY GAME
Steven J. Matherne, 12038 Charlwood St., Artesia, Calif. 90701
Filed Dec. 2, 1977, Ser. No. 856,662
Int. Cl.[3] A63F *3/00*
U.S. Cl. 273—248 **9 Claims**



1. A game comprising:

a game board being divided into a plurality of separate playing sections, each said section being substantially similar, each section to be used by an individual player, each said section including first indicia, each said first indicia to differentiate each said playing section from each other, each said playing section including a single path of a plurality of sequentially arranged playing member resting areas;

a separate playing member for each said playing section adapted to be moved sequentially across said playing member resting areas by the appropriate player for the playing section, each said playing member of each said playing section including second indicia to differentiate said playing members from each other, said second indicia of a said playing member to correspond to a said first indicia of a said playing section;

a first stack of cards being divided into numerical type cards and coded cards, there being a said coded card to correspond to each said first indicia;

a second stack of cards including a multitude of different instructions directing movement of a said playing member upon its respective said playing section; and

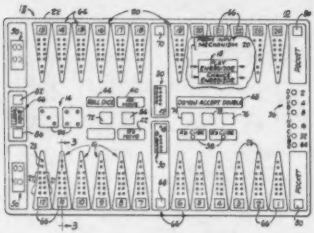
random selection means to be operated by a player during the player's playing turn to direct the player to draw an individual card of either said first stack of cards or said second stack of cards;

a plurality of said playing member resting areas within each of said playing sections including first indicia which corresponds to the particular first indicia of another said playing section.

4,223,893
ELECTRONIC GAME
Tim A. Shane, Cleveland Heights, Ohio, and Gary J. O'Hara, Ann Arbor, Mich., assignors to Tryom, Inc., Cleveland, Ohio
Filed Nov. 11, 1975, Ser. No. 630,913
Int. Cl.[3] A63F *3/02*
U.S. Cl. 273—237 **13 Claims**

1. An electronic backgammon game wherein a contestant enters an instruction for initiating play of the game, comprising:

(a) an illuminated display including pictorial representation of pips of a backgammon board and first, second, and third sets of electrically responsive visual indicators, the first set of visual indicators for manifesting a substantially randomly determined chance value, the second set of visual indicators for indicating the occupancy of a given pip during play of the game, and the third set of indicators for indicating which contestant is to enter the next in sequence play instruction;



(b) input means adapted to be mechanically actuated by the contestant for entering his play instructions; and

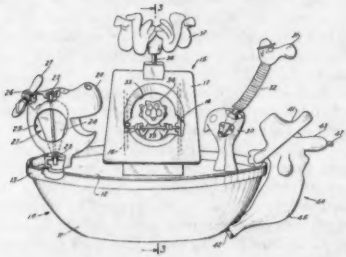
(c) means coupled to the input means and responsive to the entered play instructions for selectively energizing the first and third sets of indicators to thereby initiate play, said energizing means including means for energizing the first set of indicators to display a substantially random value and for energizing the third set of indicators according to said substantially random value to thereby indicate which contestant is to enter the first play instruction.

4,223,894

FLOATING TARGET AND WATER PROJECTOR TOY

Norman Fabricant, 94-19 64th Rd., Rego Park, N.Y. 11374

Filed Apr. 9, 1979, Ser. No. 27,954
Int. Cl.[3] A63F 9/02; F41B 9/00
U.S. Cl. 273—349 **1 Claim**



1. A water toy comprising:

(a) a float capable of floating on the surface of a body of water,

(b) at least one target member carried by the float and movable with respect to the float,

(c) a manually-operable pump means for directing a stream of water at the target member, the pump means having an inlet submersible in the body of water on which the float floats for drawing water into the pump means while the latter is operated to produce a stream, and

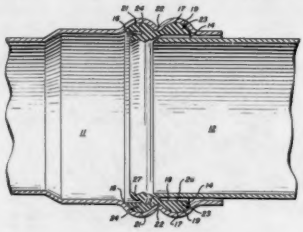
(d) means for removably mounting the pump means on the float when the pump means is not in use, said mounting means including a lip at the periphery of the float, and a hook-like formation on the pump means which fits over the lip.

4,223,895

GASKET FOR MULTIPLE GROOVE PIPE AND METHOD OF USING SAME

James E. Roberts, Jr., Canton, and James E. Voelker, Bay Village, both of Ohio, assignors to Robintech, Inc., Ft. Worth, Tex.

Continuation of Ser. No. 656,135, Feb. 9, 1976, abandoned, which is a continuation of Ser. No. 533,260, Dec. 16, 1974, abandoned. This application Aug. 7, 1978, Ser. No. 931,388
Int. Cl.[2] F16J 9/00
U.S. Cl. 277—169 **16 Claims**



1. A resilient, generally ring-like gasket for forming a seal between two interconnected pipes comprising

opposed forward and rearward axial ends;

oppositely facing first and second lateral sides;

a forward circumferential projection on said first lateral side adjacent said forward end;

a rearward circumferential projection on said first lateral side adjacent said rearward end and axially spaced from said forward projection;

a bridge portion between said forward and rearward projections;

a substantially cylindrical surface extending axially on said second lateral side adjacent said forward end and laterally opposite said forward projection, said cylindrical surface and said forward projection being substantially coextensive in an axial direction; and

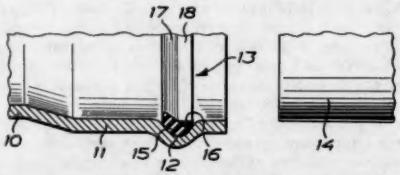
a deformable projection on said second lateral side adjacent said rearward end, laterally opposite said rearward projection, and axially spaced from said cylindrical surface, said deformable projection extending radially away from said rearward circumferential projection to a greater extent than said cylindrical surface is spaced from said forward circumferential projection.

4,223,896

SEALING RING

Torsten E. T. Ström, Fristad, Sweden, assignor to AB Gustavsberg, Fristad, Sweden

Filed Mar. 13, 1979, Ser. No. 20,064
Int. Cl.[3] F16J 15/24, 15/32
U.S. Cl. 277—207 A **15 Claims**



1. A sealing ring received by an annular groove in one of two pipe elements, the other of which pipe elements can be

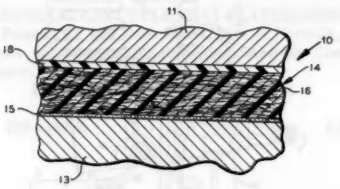
inserted into the one element to form telescoped pipe elements, said sealing ring sealing between the pipe elements, comprising: two integrated portions of different hardnesses, said portions forming two surfaces enclosing an obtuse angle, one of said surfaces being formed by the harder portion and the other one by the softer portion, said surfaces facing outwardly from the groove when the sealing ring is received therein with said one surface directed obliquely outwards from the groove to be engaged by the other of said pipe elements when the other pipe element is inserted into the one pipe element and with said other surface located substantially in the longitudinal direction of the pipe wall to be compressed against said other pipe element by a turning movement of the sealing ring in the groove provided by said other pipe element engaging said one surface.

4,223,897

ANTI-STICK, NON-LIQUID ABSORBING GASKET

Thomas E. Staab, Hinsdale, and James H. Larsen, Brookfield, both of Ill., assignors to Dana Corporation, Toledo, Ohio

Filed Nov. 6, 1978, Ser. No. 958,267
Int. Cl.³ F16J *15/12*
U.S. Cl. 277—235 B **14 Claims**



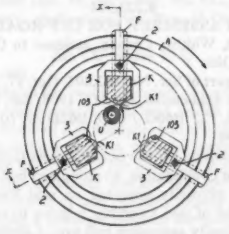
1. An anti-stick, non liquid absorbing, laminated gasket having improved resistance to delamination, said gasket comprising a metallic base sheet and a bonded fibrous layer laminated to at least one face of said base sheet in side-by-side relation, said fibrous layer containing a liquid-impermeable resinous impregnant extending throughout the fibrous layer as a substantially continuous barrier to make said layer liquid-impermeable in a direction from one face thereof to the other, and an anti-stick coat disposed along an outer face of said fibrous layer and adhered to said layer substantially solely by contact with fibers of said layer or with said resinous impregnant barrier.

4,223,898

RETAINER DEVICE FOR CHUCK JAWS

Nerio Righi, 6, Via Zacconi, Casalecchio di Reno, Italy, assignor to Rivelica S.n.C. di Limoni Clindo; Adriano Del Carlo and Nerio Righi, all of Bologna, Italy

Filed Nov. 29, 1978, Ser. No. 964,723
Int. Cl.³ B23B *31/00*
U.S. Cl. 279—1 R **7 Claims**



1. A device for temporarily retaining a plurality of relatively movable chuck jaws of a chuck in a predetermined relative position, comprising

a carrier ring;

at least two spaced blocking slides mounted for radial movement on said ring;

means for adjusting the radial position of said slides; and

a double-hook element mounted on each slide and having opposed hook arms;

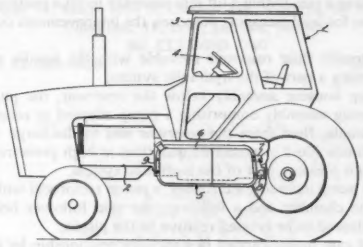
said opposed hook arms of each hook element having means for engaging opposite sides of the corresponding chuck jaws for radially retaining said chuck jaws in a fixed relative position with the adjusted position of said slides.

4,223,899

ISOLATED FUEL TANK

Gregory A. Krieger, Brookfield, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Dec. 4, 1978, Ser. No. 966,116
Int. Cl.³ B60K *15/02*
U.S. Cl. 280—5 A **13 Claims**



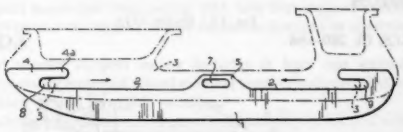
1. A vehicle including, a tank, a vehicle chassis, flange means on said vehicle tank defining horizontal and vertical flanges, means defining horizontal and vertical flanges on said chassis, a plurality of resilient isolators mounted between said horizontal flanges resiliently supporting the weight of said tank, resilient isolators mounted between said vertical flanges to dampen transverse vibrations of said tank.

4,223,900

BLADE FOR ICE SKATES

Icaro Olivieri, Montebelluna, Italy, assignor to Iceslj A.G., Vaduz, Liechtenstein

Filed May 30, 1978, Ser. No. 910,625
Int. Cl.² A63C *1/32*
U.S. Cl. 280—11.12 **8 Claims**



1. An ice skating blade for embedding in a supporting body of plastic material by which the blade is affixed to a shoe for skating, comprising an upper, embeddable edge, and a transverse longitudinally closed and rounded passageway in the vicinity of said upper edge; said passageway having a greater longitudinal length than vertical height to provide for the shrinkage of said plastic material; and means extending longitudinally with respect to said edge and forming an open projection at the same level as said transverse passageway said projection forming an anchoring means for anchoring said blade in said supporting body.

4,223,901

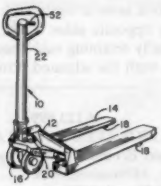
HYDRAULIC LIFT TRUCK

Richard E. Klemick, Pottsville, Pa., assignor to Liftanroll, Inc., Pottsville, Pa.

Filed Dec. 8, 1977, Ser. No. 858,750

Int. Cl.[2] B66F *5/04*

U.S. Cl. 280—43.12 **49 Claims**



1. In a hydraulic lift truck of the type including a frame mounted upon wheels, a handle and a hydraulic system capable of elevating a ram within a lift ram assembly to lift a portion of the frame for load transport purposes, the improvements comprising

a hydraulic fluid reservoir movable with the handle and forming a part of the hydraulic system;

a pump housing assembly below the reservoir, the pump housing assembly comprising a pump adapted to receive hydraulic fluid from the reservoir and to discharge the hydraulic fluid in measured quantities at high pressure to a high pressure part of the hydraulic system,

said pump including a chamber, a piston reciprocal within the chamber and a follower, the said follower being adapted to be rotated relative to the piston;

shaped cam means carried in stationary relationship by the lift ram assembly and adapted to be contacted by the follower to reciprocate piston,

said follower being in moving contact with the cam means when the handle is arcuately reciprocated relative to the cam means to reciprocate the piston,

whereby the high pressure hydraulic fluid effluent from the pump elevates the lift ram in incremental steps as the handle is arcuately rotated; and

a release means to release high pressure hydraulic fluid into the reservoir to lower the elevated lift ram.

4,223,902

VEHICLE SUSPENSION

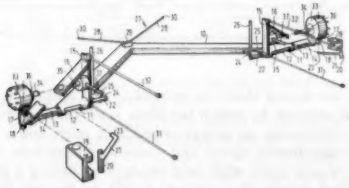
Timothy S. Fry, Dunchurch, England, assignor to GKN Group Services Limited, Warley, England

Filed Jan. 31, 1979, Ser. No. 7,937

Claims priority, application United Kingdom, Feb. 15, 1978, 5937/78

Int. Cl.[3] B62D *7/16*

U.S. Cl. 280—96 **4 Claims**



1. A vehicle wheel mounting assembly comprising a rigid axle beam having at each end thereof a non-steerable element including a steering bearing means, a spindle mounting said non-steerable element on said axle beam for pivotal movement of the non-steerable element about an axis extending transversely of the vehicle, a steerable element supported on said non-steerable element by said steering bearing means and including a rotatable hub for a ground engaging wheel, said steering bearing means being located wholly below the rotary axis of the hub when the assembly is in use, means mounting a steering control element slideably of the axle beam substantially on said transverse axis, a track rod, means operatively connecting the track rod to the steerable element and to the steering control element at a level below said hub rotary axis, and said track rod extending inwardly of the vehicle.

4,223,903

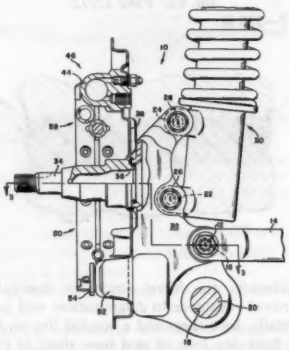
INTEGRAL SUSPENSION MEMBER

Frederick G. Grabb, and James K. Roberts, both of South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed May 9, 1978, Ser. No. 904,352

Int. Cl.[3] B60G *7/00*; B60T *1/06*

U.S. Cl. 280—96.1 **10 Claims**



1. A vehicle road wheel suspension comprising:

a suspension member having a pair of substantially mirror image portions secured one to another and defining a plane of symmetry;

a spindle for rotatably carrying a road wheel assembly and having an axis, a free end, a fixed end, and being carried by said member at said fixed end with its axis substantially in said plane of symmetry;

said member including means for carrying a wheel brake assembly;

each of said portions defining an aperture coaxially aligned with a corresponding aperture in the other portion;

said member being pivotally attached to a vehicle suspension bracket by a pin passing through said apertures and engaging said bracket.

4,223,904

SUSPENSION ASSEMBLY FOR OFF-ROAD VEHICLE

Bruce J. McColl, Whitby, Canada, assignor to Owens-Illinois, Inc., Toledo, Ohio

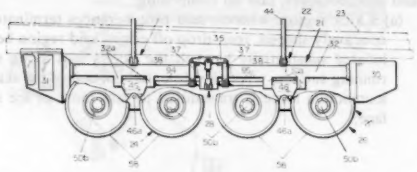
Continuation-in-part of Ser. No. 842,801, Oct. 17, 1977, Pat. No. 4,153,265. This application Aug. 17, 1978, Ser. No. 934,459

Int. Cl.[2] B60G *19/10*; B62D *61/10*

U.S. Cl. 280—104 **5 Claims**

3. A vehicle adapted for use over roadless terrain, said vehicle comprising, in combination, an elongated bed frame, a front wheel assembly pivotally mounted on said frame to permit pivotal movement of said assembly relative to said bed frame about a longitudinally extending roll axis, a similarly mounted rear wheel assembly, and a roll control means interconnecting said wheel assemblies with each other and with said frame such that the frame is proportionately rotated about its roll axis by

the rotation of said wheel assemblies relative to each other, the improvement comprising a pair of load supporting cradles respectively pivotally mounted on said bed frame above said wheel assemblies for movement about an axis parallel to said



roll axis, and a parallelogram linkage connected between each wheel assembly and the respective overlying cradle, whereby said cradles are respectively pivoted relative to said bed frame concurrently with pivotal movements of the underlying wheel assembly about said roll axis.

4,223,905

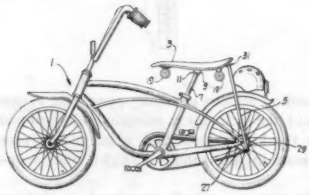
COMBINATION CYCLE SEAT-SKATEBOARD

Charles Persons, II, and Robb Harst, both of Norwalk, Ohio, assignors to Persons-Majestic Manufacturing Company, Worcester, Mass.

Filed Dec. 21, 1978, Ser. No. 972,046

Int. Cl.³ A63C *17/00*; B62J *1/28*

U.S. Cl. 280—289 R **9 Claims**



8. A bicycle comprising a seat support member, a seat removably attached to said support member, said seat including a plurality of wheels and means for attaching said wheels to the bottom of said seat for rotation about parallel horizontal axes, and further including a safety bar member attached to said bicycle, and means for removably attaching said seat to said safety bar.

4,223,906

INSTALLATION FOR LOWERING A KICKSTAND ARRANGED ON A MOTORCYCLE

Peter Gratza, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

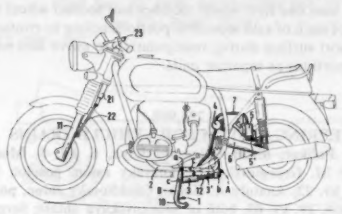
Filed Dec. 19, 1977, Ser. No. 862,155

Claims priority, application Fed. Rep. of Germany, Dec. 22, 1976, 2658056

Int. Cl.² B62H *1/02*

U.S. Cl. 280—301 **19 Claims**

1. An installation for swinging down a kickstand arranged at a motorcycle comprising a kickstand which is pivotally supported on the frame of a motorcycle and which is adapted to be pivoted into a parking position, cylinder means pivotally connected between the frame of the motorcycle and the kickstand for pivoting said kickstand toward said parking position in response to actuation of said cylinder means, pressure storage means for storing a pressure medium for actuating said cylinder means, pump means arranged on the motorcycle for supplying said pressure storage means with pressure medium, said pump means being actuated by oscillatory movements of the motorcycle, and control valve means being located between said pressure storage means and said cylinder means for controlling the supply of pressure medium from said pressure



storage means to the cylinder means for actuating said cylinder means.

4,223,907

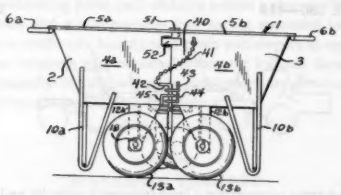
SEPARABLE MORTAR VEHICLE

Thomas M. Kelly, 7551 N. Oakley Ave., Chicago, Ill. 60645

Filed Dec. 11, 1978, Ser. No. 968,307

Int. Cl.³ B60D *7/00*

U.S. Cl. 280—408 **13 Claims**



1. A separable hand operated vehicle comprising a plurality of separable portions adapted to be positioned and moveable on a support surface as a unitary unit or as separate units,

each of said separable portions further including body means having a recessed shape adapted to receive and contain material,

said separable portions each further including first support means to aid in maintaining said plurality of said separable portions in an uprtight position when stationary and permit movement thereof in response to application of force,

said first support means including at least one rotatably mounted first wheel member respectively coupled to each of said separable portions,

said separable portions each further including second support means for cooperating with said first support means to permit movement of said separable portions as separate units,

said second support means includes at least one second rotatably mounted wheel member respectively coupled to each of said separable portions,

stationary support means operatively coupled to each of said separable portions, said stationary support means being arranged to be out of contact with the support surface during movement of the separate portions as a unitary unit or as separate units, said stationary support means acting to contact the support surface while each of said separate portions are stationary as separate units,

handle means secured to each of said separable portions for manipulating each portion as a unitary unit and as separate units by applying a force thereto,

securement means for releasably securing said plurality of said separable portions as a unitary unit,

said at least one first wheel member of each of said separable portions acting to contact the support surface with said at

least one second wheel member being out of contact therewith during manipulation to move said separable portions as an unitary unit, and

said at least one first wheel member and second wheel member of each of said separable portions acting to contact the support surface during manipulation to move said separable portions as separate units.

4,223,908

STEERING SYSTEM FOR VEHICLE TRAINS

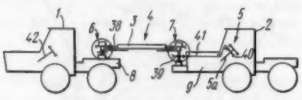
Boris E. Poliker, ulitsa Velozavodskaya, 6, kv. 5, Moscow; Georgy M. Georgievsky, Chekhovsky raion, poselok Novy byt, 4, kv. 22; Anatoly A. Kotov, Chekhovsky raion, poselok Novy byt, 29, kv. 65, both of Moskovskaya oblast; Sergei P. Kozyrev, ulitsa Verkhnaya, 18, kv. 32, Moscow; Nikolai N. Markelov, ulitsa Krasnoarmeiskaya, 30, kv. 17, Moscow; Nikolai F. Chukhchin, ulitsa Verkhnaya, 18 kv. 44, Moscow; Eduard A. Kalinin, Ruzheiny pereulok, 4, kv. 200, Moscow; Sergei S. Dmitrichenko, ulitsa Verkhnaya, 18, kv. 58, Moscow; Alexandr P. Ishanov, ulitsa Planernaya, 12, korpus 1, kv. 445, Moscow; Boris P. Kashuba, ulitsa Girshmana, 17"B", kv. 3, and Adolf D. Levitanus, ulitsa Garshina, 5/7, kv. 2, both of Kharkov, all of U.S.S.R.

Filed Sep. 11, 1978, Ser. No. 940,997

Claims priority, application U.S.S.R., Sep. 21, 1977, 2524093[I]

Int. Cl.[2] B60D *13/00*

U.S. Cl. 280—419 **2 Claims**



1. In a train comprising a lead transport vehicle; and at least one succeeding transport vehicle, each having a respective steering gear, devices for actuating said steering gears of said succeeding transport vehicles, each of said devices located between a succeeding transport vehicle and a transport vehicle preceding the same, and each device comprising: a first vertical shaft selectively rotatably mounted on the body of said preceding transport vehicle, a second vertical shaft rotatably mounted on the body of said succeeding transport vehicle, a first pulley mounted for rotation with said first vertical shaft, a second pulley mounted for rotation with said second vertical shaft, a flexible pulling member wound around said pulleys, a pair of bushings, each being located on one of said first and second vertical shafts, a link with one end thereof secured to said bushing of said first vertical shaft and the other end secured to said bushing of said second vertical shaft, drive means kinematically associated with said first shaft for selectively reversibly rotating the same and remotely controlled from said lead transport vehicle, an additonal pulley secured on said second vertical shaft, a pulley secured on the shaft of said steering gear of said succeeding transport vehicle, a flexible pulling member wound in a crosswise manner around said additional pulley and a pulley mounted on the shaft of said steering gear of said succeeding transport vehicle.

4,223,909

SKI WITH IMPROVED THREE-DIMENSIONAL RUNNING SURFACE

William D. Danner, Byfield, Mass., and Hans Woitschatzke, Grunwald, Fed. Rep. of Germany, assignors to Trak Incorporated, Ward Hill, Mass.

Filed Mar. 1, 1979, Ser. No. 16,121

Int. Cl.[3] A63C *7/06*

U.S. Cl. 280—604 **20 Claims**

1. A ski for use by a skier on snow or ice surfaces, said ski having a front end and a rear end and a three-dimensional, bottom, running surface, which surface comprises a plurality of protuberances which are inclined with respect to the bottom plane of said running surface by rising towards said rear end of said ski before dropping off, and which running surface is further characterized by a longitudinal pattern in the shape of said protuberances, said ski comprising:

(a) a kick region, wherein said protuberances terminate in concavely shaped, rear, drop-off edges, said region being located substantially beneath the skier's foot along said running surface, where a substantial portion of the skier's locomotive force is transmitted to said snow or ice surface;

(b) transition regions generally proximate to, and on both sides of, the kick region, extending forward and rearward from the kick region, and wherein said protuberances terminate in substantially straight, rear, drop-off edges; and

(c) glide regions generally proximate to the transition regions and extending from the transition regions toward the ends of the ski, wherein said protuberances terminate in convexly shaped, rear, drop-off edges, said gliding regions being located along said running surface, so as to bear a portion of the skier's weight while gliding, thereby providing a ski with enhanced gliding and kicking properties.

4,223,910

VEHICLE SUSPENSIONS

Timothy S. Fry, Dunchurch, England, assignor to GKN Group Services Limited, Warley, England

Filed Aug. 2, 1978, Ser. No. 930,177

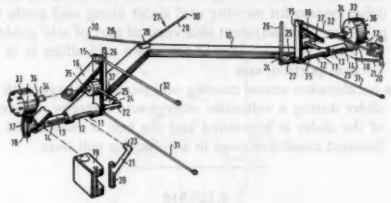
Claims priority, application United Kingdom, Aug. 13, 1977, 34078/77; Feb. 15, 1978, 5937/78

Int. Cl.[3] B62D *7/00*

U.S. Cl. 280—660 **9 Claims**

1. An axle assembly for a road vehicle, comprising an axle beam having oppositely disposed limbs; means constraining the centre of the axle beam to translatory movement in a plane extending force and aft of the vehicle while permitting universal pivoting of the axle beam; aligned hollow spindles received in the end portions of the limbs of the beam to extend transversely of the vehicle; a hub carried by each spindle; an arm carried by each spindle extending generally upwardly therefrom, at least one radius rod on each side of the vehicle, each said one radius rod being connected to its associated arm at a position remote from the spindle, control rods located in the spindles, the control rods being connected to track rods which

pass out of the spindles through slots in the walls thereof and are connected to the hubs by steering arms for effecting steering of the hubs upon movement of the control rods longitudinally within the spindles.

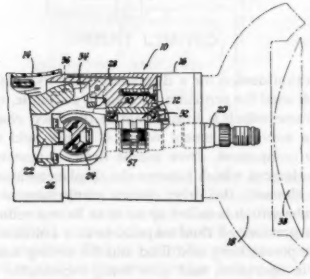


4,223,911

ELECTRICAL CONNECTOR ARRANGEMENT FOR MOTOR VEHICLE STEERING ASSEMBLY

William D. Cymbal, Freeland, and William R. Knuth, Saginaw, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 6, 1978, Ser. No. 883,697
Int. Cl.[2] B60R *21/02*
U.S. Cl. 280—731 2 Claims



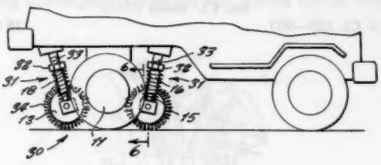
1. In combination with a motor vehicle steering assembly including a steering column member rotatably supporting a steering shaft fixed to a steering wheel having an occupant restraint cushion, said vehicle having a sensor for actuating said occupant restraint cushion, an electrical connector arrangement interposed between said steering column and said steering shaft for allowing relative movement therebetween while continuously providing electrical continuity between said sensor and said occupant restraint cushion, said electrical connector arrangement comprising a cylindrical insulator sleeve having a groove portion for location in a slot formed in said steering shaft, a pair of conductor rings mounted on said insulator sleeve, a tab integrally formed with each of said conductor rings and positioned within said groove portion, said tab of each conductor ring adapted to be electrically connected to said occupant restraint cushion, each of said conductor rings having a curved track formed in the periphery thereof and being located in a plane that is substantially perpendicular to the longitudinal center axis of the steering shaft, and a pair of flexible contact members fixed to said steering column member for continuously maintaining engagement with the track in each of the conductor rings and adapted to provide current to said conductor rings upon operation of said sensor.

4,223,912

VEHICULAR WHEEL LOAD REDUCING DEVICE

Daniel Reyes, 233 Broadway, Rm 3615, Brooklyn, N.Y. 10007

Filed Jun. 22, 1978, Ser. No. 918,147
Int. Cl.[2] B60G *17/00*
U.S. Cl. 280—767 4 Claims



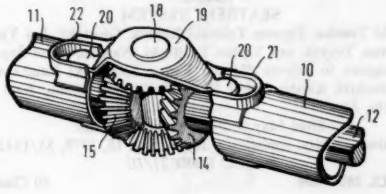
1. A vehicle construction incorporating a wheel load reducing means, comprising in combination, a vehicle body and chassis spring supported upon a plurality of wheel assemblies, including plurality of additional wheel devices positioned close to the wheels of said wheel assemblies for traveling on a ground surface near said wheels of said wheel assemblies, said wheel devices including wheels having a peripheral groove in which a tension coil spring is fitting for engaging said ground surface wherein said wheel devices each include a wheel being mounted on an axle supported in blocks integral with a pair of upward extending posts each slidable within a sleeve affixed to said chassis and a compression coil spring mounted on each said sleeve resiliently biasing said posts and sleeves in opposite directions wherein said wheel devices are located forwardly and rearwardly of said wheel assembly and are downwardly inclined toward said wheel assembly.

4,223,913

STEERABLE VEHICLES

Timothy S. Fry, Dunchurch, England, assignor to GKN Group Services Limited, Warley, England

Filed Aug. 30, 1978, Ser. No. 938,326
Claims priority, application United Kingdom, Sep. 9, 1977, 37646/77
Int. Cl.[3] B62D *1/00*
U.S. Cl. 280—771 7 Claims



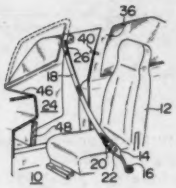
1. A steerable vehicle comprising a rigid axle carrying steerable wheels; a steering box having a housing secured to the axle, an input rotatable relative to the housing and an output; means connecting said output to the steerable wheels; steering control means having first and second relatively rotatable parts; and means connecting the first part of the steering control means and said housing and having a first element arranged to take up an average position between said first part and the housing during relative rotation therebetween, and gearing means operatively connected between the second part of the steering control means and said input, said gearing means having a second element connected to said first element for simultaneous movement therewith and which takes up an average position between said second part and said input during relative rotation therebetween.

4,223,914

SEATBELT SYSTEM

Susumu Usami; Toshiaki Asai, and Yoshio Tsujiuchi, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Nov. 27, 1978, Ser. No. 963,867
Claims priority, application Japan, Nov. 28, 1977, 52-159296
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—803 **15 Claims**



1. A seatbelt system for a vehicle of the type having at least one passenger door surrounded by a door frame in the vehicle body into and out of which frame the door moves when closing and opening, said system comprising:

a length of webbing for restraining a passenger;

retractor means installed at an upper portion of said door and attached to one end of said length of webbing for winding up said length of webbing;

means for attaching the other end of said length of webbing within said vehicle so that said length of webbing is fitted obliquely to or released from the passenger as said door is closed or opened, respectively;

an engaging portion formed on said retractor means; and

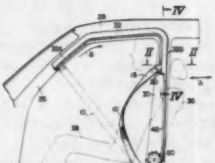
an engageable portion formed on said door frame to be engageable by said engaging portion, for securing said retractor means relative to said door frame and yet allowing said length of webbing to move into and out of said retractor means when said door is closed, whereby forces applied to said length of webbing during an emergency are imparted to said vehicle body via said engaging and engageable portions.

4,223,915

SEATBELT SYSTEM

Hideki Tanaka, Toyota; Tatsushi Kubota, Okazaki; Jun Yasumatsu, Toyota, and Yoshio Tsujiuchi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha and Kabushiki Kaisha Tokai Rika Denki Seisakusho, both of Aichi, Japan

Filed May 8, 1979, Ser. No. 37,103
Claims priority, application Japan, Sep. 18, 1978, 53/114255
Int. Cl.[3] B60R *21/10*
U.S. Cl. 280—804 **10 Claims**



1. A seatbelt system for a motor vehicle which automatically fastens and unfastens a restraining belt about a passenger comprising:

a slider to which one end of said passenger restraining belt is fastened;

a guide rail for guiding said slider fastened along a body of said vehicle and having at least one vertical portion;

a drive system for moving said slider along said guide rail;

a pawl provided adjacent said vertical part of said guide rail for engaging with said slider when said slider is in said vertical portion; and

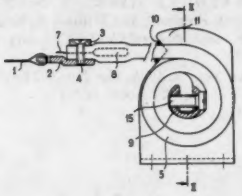
an acceleration sensor causing said pawl to engage with said slider during a vehicular emergency whereby movement of the slider is prevented and the belt is maintained in a fastened condition even in a vehicular roll over.

4,223,916

TRACTION DEVICE FOR SAFETY BELTS

Jean-Francois Tillac, Bordeaux Cauderan, France, assignor to Societe Nationale des Poudres et Explosifs, Paris, France

Filed Apr. 10, 1978, Ser. No. 894,689
Claims priority, application France, Apr. 20, 1977, 77 11941
The portion of the term of this patent subsequent to Mar. 4, 1997, has been disclaimed.
Int. Cl.[2] B60R *21/10*
U.S. Cl. 280—806 **22 Claims**



1. Traction device for a displaceable component such as a safety belt used for protecting people in a vehicle, comprising a fixed frame which is firmly held to the fixed chassis of the vehicle, a movable element which is firmly held to the displaceable component, drive means firmly connected to said movable element which ensures the displacement of the said movable element, the drive means comprising at least one flexible tube which is rolled up so as to have a reduced cross-section, a pressurized fluid responsive to a collision detector, means for pressurizing said fluid and for setting said collision detector in operation, said tube being expandable under the action of said pressurised fluid, said flexible tube being connected at not less than two different portions, on the one hand being connected to and being trained around an axle which is connected to the said fixed frame, and on the other hand to the said movable element.

4,223,917

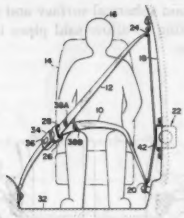
SEATBELT SYSTEM

Mamoru Mori, Okazaki; Shiro Sasaki, and Eiichi Kinaga, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Feb. 9, 1979, Ser. No. 10,618
Claims priority, application Japan, Feb. 9, 1978, 53-15168
Int. Cl.[3] A62B *35/00*
U.S. Cl. 280—806 **7 Claims**

1. A seatbelt system wherein the proximal ends of a lap webbing and a shoulder webbing are wound up doubly by a single take-up shaft provided at one side of a seat for an occupant through a biasing force, the forward portions of said webbings are connected to each other, and a tongue plate is provided slidably in the longitudinal direction of the webbings for being engageable with buckle means provided on the other end of said seat for the occupant, characterized in that the thickness of the webbings are substantially increased at portions adjacent the forward connected portions of said both webbings so as to form a pair of stoppers, whereby the tongue

plate is adapted to be slidable between said stoppers, thereby limiting the movement of the tongue plate and one of said stoppers is adapted to be engageable with the other whereby



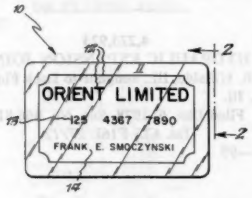
when said stoppers are engaged with each other, the webbing is formed into a ring shape and the tongue plate receives the ring therethrough.

4,223,918

COLOR CODED CREDIT CARD

Frank E. Smoczynski, 101 E. Oak-Glen Dr., Bartlett, Ill. 60103

Filed Jul. 17, 1978, Ser. No. 925,381
Int. Cl.³ B42D *15/00*
U.S. Cl. 283—7 **11 Claims**



1. A laminated plastic color coded credit card comprising first layer means of plastic material of a first color extending to a plurality of edges of said card, and second layer means of plastic material of a second color laminated relative to said first layer means and extending to a plurality of edges of said card, said first and second layer means lying in face-to-back relationship and extending continuously throughout a substantial portion of the extent of said plurality of edges of said credit card and being of sufficient thickness so as to be detectable from the edges of said card for providing a coded pattern for identification purposes at the edges of said card, and raised lettering on said card for identifying the holder of said card.

4,223,919

DEVICE FOR COUPLING HOSE, PIPE OR THE LIKE

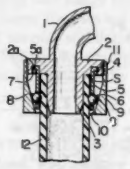
Hisaharu Kurachi, 11, Kawasakicho-2-chome, Chikusa-ku, Nagoya-shi, Aichi-ken, Japan

Filed Apr. 24, 1979, Ser. No. 32,845
Claims priority, application Japan, Jan. 19, 1978, 53-3685
Int. Cl.² F16L *33/22*
U.S. Cl. 285—8 **5 Claims**

1. A device for coupling a hose to a pipe comprising: an annular flange means securely provided around said pipe adjacent its outlet, an inside cylindrical member coaxially disposed around the outlet portion of said pipe so as to define an annular space for receiving the end portion of said hose between said outlet portion and said inside cylindrical member, means for freely rotatably connecting said inside cylindrical member at its one end to said flange means while constraining the axial movement of said inside cylindrical member with respect to said flange means,

said inside cylindrical member having a plurality of circumferentially spaced holes therein, rolling elements rotatably fitted into said holes so as to project from the inner and outer walls of said inside cylindrical member, and

an outside cylindrical member coaxially disposed around said inside cylindrical member in spaced relationship therefrom engaged by threads at one end with said flange means, the inner wall of said outside cylindrical member being converged towards the end thereof remote from



said flange means and in rolling engagement with said rolling elements,

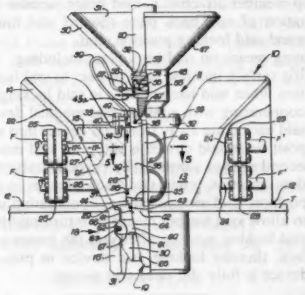
whereby said hose maybe inserted into said annular space so that when said outside cylindrical member is turned in one direction, it is axially displaced towards said flange means thereby urging said rolling elements against said hose, to firmly clamp said hose around said outlet portion of said pipe.

4,223,920

VERTICALLY RETRIEVABLE SUBSEA CONDUIT CONNECTOR

Bernard H. Van Bilderbeek, Ventura, Calif., assignor to Vetco, Inc., Ventura, Calif.

Filed Nov. 25, 1977, Ser. No. 854,785
Int. Cl.² F16L *37/08*
U.S. Cl. 285—24 **13 Claims**



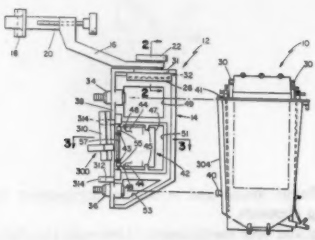
1. Underwater fluid conduit connector apparatus comprising: a body structure having first passage means for the flow of fluid through said body structure; said body structure including means connectable with a pipe string for lowering said body structure in the water; a receptacle having an open upper end; means for mounting said receptacle at the bottom of the water and providing fluid inlet and outlet conduits; said receptacle having ports in communication with said conduits; said receptacle and said body structure having means for aligning said passage means with said ports upon lowering of said body structure into said receptacle; fluid pressure operated locking means for releasably locking said body structure in said receptacle; and operating fluid passage means in said body structure for conducting operating fluid pressure from said pipe string to said locking means.

4,223,921

MOUNT FOR SUPPORTING A MEDICAL DEVICE

Thomas E. Goyne, Denver; Stephen J. Herman, Evergreen; Joel F. Giurtino, Littleton, and Robert L. Anderson, Boulder, all of Colo., assignors to Cobe Laboratories, Inc., Lakewood, Colo.

Filed Jun. 23, 1978, Ser. No. 918,360
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—26 8 Claims



1. A mount for supporting a medical device, said mount comprising:

a brace member for supporting a medical device placed alongside thereof,

a horizontal track on said brace member for cooperating with a horizontal lip on said device to guide said device as it is slid onto said mount, said track defining an insertion direction,

a back plate rotatably attached to a shaft which is attached to said brace member, whereby rotation of said back plate about the longitudinal axis of said shaft is allowed, said plate being rotatable away from said device from a locking position to an insertion position, said back plate including a gripping portion to allow manual rotation of said plate,

means for biasing said back plate toward said medical device, said means being operably attached to said back plate,

a stop member attached to said brace member for stopping rotation of said back plate toward said medical device beyond said locking position, and

camming means on said back plate including

a first surface inclined with respect to said insertion direction when said back plate is in said locking position for cooperating with a tab on said medical device to rotate said back plate away from said device into said insertion position as said device is slid onto said mount and

a second surface substantially perpendicular to said insertion direction when said back plate is in said locking position, said second surface cooperating with said tab to allow said biasing means to return said back plate to said locking position after said tab passes said first surface, thereby locking said device in place when said device is fully slid onto said mount.

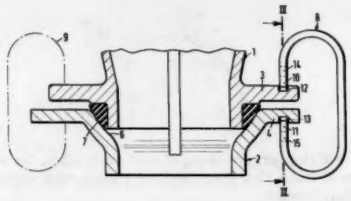
4,223,922

FLEXIBLE PIPE CONNECTION

Karl Pape, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 23, 1979, Ser. No. 14,342
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810584
Int. Cl.[2] F16L *35/00*
U.S. Cl. 285—39 2 Claims

1. In apparatus for providing a releasable, flexible sealed connection between first and second pipes, said apparatus comprising: a spherical sealing surface projecting axially outwardly from an end of said first pipe, an axial accommodating space on an end of said second pipe for receiving said spherical surface, first and second clamping structures rigidly attached to said first and second pipes, respectively, and at least one spring clamp having opposite ends directed toward each other and bottomed in oppositely facing recesses on said first and second clamping structures to urge said spherical surface into said accommodating space, said recesses having an arcuate cross section and said spherical surface and said accommodating space cooperating to allow said pipes to swivel with respect to each other;



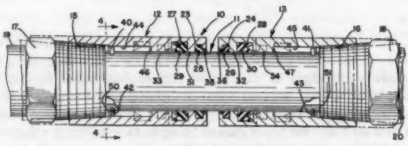
the improvement wherein said at least one spring clamp is a flat C-shaped nonoverlapping spring, said spring formed with a width substantially greater than its thickness and with rounded ends forming an arc which lay in the plane of said width of said spring, said arc having radii of curvative less than the radii of curvature of said curved paths of said recesses.

4,223,923

HYDRAULIC EXPANSION JOINT

James C. Hill, Hillside, Ill., assignor to Lach Fluid Power, Inc., Maywood, Ill.

Filed Dec. 6, 1978, Ser. No. 966,817
Int. Cl.[2] F16L *27/12*
U.S. Cl. 285—95 3 Claims



1. A metal hydraulic expansion joint for interconnecting hydraulic pipes or hoses comprising, a floating sleeve having opposed ends and a pair of pipe or hose fittings slidably mounted on said sleeve and having means for securing the fittings to the pipes or hoses, said sleeve being cylindrical with substantially constant interior and exterior surfaces along its entire length and said ends having equal areas thereby hydraulically balancing the sleeve, annular wiper and annular seal means, each said fitting having spaced slots for receiving said wiper and seal means, the wiper and slot therefor being at one end of the fitting and the seal and slot therefor being spaced inwardly therefrom, lands formed on both sides of said seal slot which are sized slightly larger than the exterior surface of said sleeve, and coacting stop means on said sleeve and fittings limiting the relative movement therebetween.

4,223,924

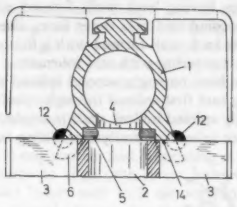
TUBE JOINT BETWEEN TWO INTERSECTING TUBES

Anton Schwarz, Höhenstrasse 24 a, A-6020 Innsbruck, Austria

Filed Sep. 18, 1978, Ser. No. 943,351
Int. Cl.[2] F16L *13/02*
U.S. Cl. 285—189 6 Claims

1. A tube joint between two intersecting tubes of a light metal radiator comprising a first tube having at least two ribs

extending in a longitudinal direction thereof and projecting from both sides thereof, a second tube being a header transversely extending with respect to the ribs of said first tube, one end of said first tube communicating with an aperture in the



surface of said second tube, a washer provided between said one end of said first tube and said aperture of said second tube, and a spot weld arranged between said second tube and each of said ribs of said first tube, said second tube being pressed and held against said first tube by means of said spot welds.

4,223,925

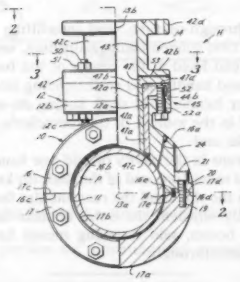
HOT TAP MACHINE

Bobby J. Reneau, 15527 Morales, Houston, Tex. 77029, and Luther L. Manchester, 810 Woodstock, Bellaire, Tex. 77401

Filed Nov. 1, 1978, Ser. No. 956,877

Int. Cl.[2] F16L *41/04*

U.S. Cl. 285—197 **8 Claims**



1. A hot tap housing for mounting over a main pipeline adapted for use with a hot tap machine to connect a lateral pipeline to a main pipeline positioned in an environmentally restrictive location such as underwater, comprising:

a housing assembly including a central housing section and a lateral housing section;

said central housing section being cylindrical in configuration and having a central bore therein having a longitudinal axis parallel to the axis of the main pipeline;

said central housing section including mount means adapted for mounting said central housing section over a main pipeline which is located underwater or in another environmentally restrictive location;

said lateral housing section having an access bore therein having a longitudinal axis at an angle such as perpendicular with respect to the axis of said central housing section;

first and second central housing sealing means mounted at least partly in said central housing section bore for gripping and sealing off the main pipeline on either side of said lateral housing section;

an access seal means mounted with said lateral housing section for movement in said lateral housing section bore inwardly toward said main pipeline into sealing engagement with the outer surface of the main pipeline;

said access seal means including an access seal housing mounted onto said lateral housing section by threaded connectors, said access seal housing including a tubular section positioned in said lateral housing section access bore and cooperating with said lateral housing section to form first and second annular spaces therebetween;

a generally tubular sealing sleeve including a tubular portion positioned in said first annular space and a flange portion positioned in said second annular space; and

threaded actuators mounted with said lateral housing section and threadedly engaging said flange portion of said generally tubular sealing sleeve for moving said sealing sleeve within said first and second annular spaces toward said pipeline for sealing off an approximately circular area which is to be cut out and removed by a hot tap machine.

4,223,926

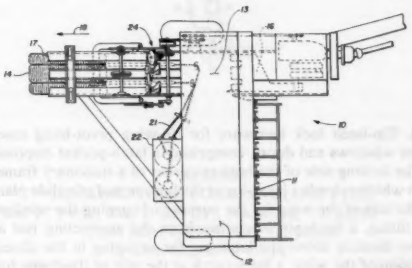
KNOT TYING MECHANISM

Edwin B. Nolt, New Holland, Pa., assignor to Sperry Corporation, New Holland, Pa.

Filed Feb. 8, 1979, Ser. No. 10,206

Int. Cl.[3] B65H *69/04*

U.S. Cl. 289—10 **15 Claims**



14. A knotter for a baling machine including a support frame; a twine disc rotatably mounted on said frame about a first axis; a billhook including an elongate shaft rotatably mounted on said frame about a second axis spaced from said first axis, said shaft intersecting and extending through said twine disc; and means for rotating said twine disc and said billhook in timed relation.

4,223,927

CAR DOOR LOCK DRIVING DEVICE

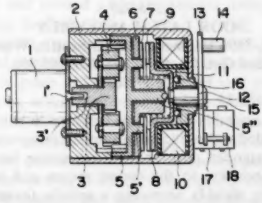
Nobuo Kobayashi, and Sadao Nakano, both of Yokohama, Japan, assignors to Niles Parts Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,413

Claims priority, application Japan, Apr. 28, 1978, 53-055823[U]

Int. Cl.[3] E05C *13/10*

U.S. Cl. 292—1 **7 Claims**



1. A car door lock driving device comprising:

a motor,

reduction gearing having an input side and an output side, said input side connected to the motor for increasing the motor torque, and

means, including an electromagnetic clutch, for transmitting the torque from said output side of said reduction gearing to a linkage to alternately lock and unlock the car door.

4,223,928

WINDOW HARDWARE

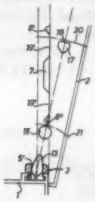
Ernst Roth, Wilnsdorf, Fed. Rep. of Germany, assignor to Siegenia-Frank KG, Siegen, Fed. Rep. of Germany

Filed Feb. 5, 1979, Ser. No. 9,056

Claims priority, application Fed. Rep. of Germany, Feb. 14, 1978, 7804212[U]

Int. Cl.[2] E05C *1/06*

U.S. Cl. 292—157 **5 Claims**



1. Tip-latch lock hardware for tip-wing pivot-hung casement windows and doors, comprising a latch-pocket disposed at the locking side of the bottom corner of a stationary frame, into which extends a latch-lug at the bottom end of a slide plate at the side of the wing for the purpose of opening the window by tilting, a latch-pin extending from the connecting rod at some distance above the latch-lug for engaging in the closed position of the wing, a latch-catch at the side of the frame lug with a transverse shoulder, located about and spaced from the latch-pin, projecting from the side plate in the direction of the plane of the wing and transversely of the direction of thrust of the side plate to said shoulder, a first stationary cam lying above the latch-pocket and the latch-catch at the stationary frame offset to the longitudinal median plane of the latch-pocket towards the side of the room, said cam being positively undercut by the shoulder in the tipped position of the window wing,

characterized by the fact that, a second stationary cam is located below the latch-catch, and lies offset from the longitudinal median plane of the latch-pocket towards the side of the room at the stationary frame which lies in the tipping postion of the wing above the latch-pin, a shoulder being positioned in locking relationship beneath said first cam for small to medium angular positions of the wing, while the latch-pin is positioned in locking relationship beneath said second cam for medium to large angular positions of the wing.

4,223,929

DOOR LATCH ASSEMBLY

Robert S. Lint, 7800 Perimeter Rd. S., Seattle, Wash. 98108

Filed Oct. 27, 1978, Ser. No. 955,396

Int. Cl.[2] E05C *1/16*

U.S. Cl. 292—169.18 **2 Claims**

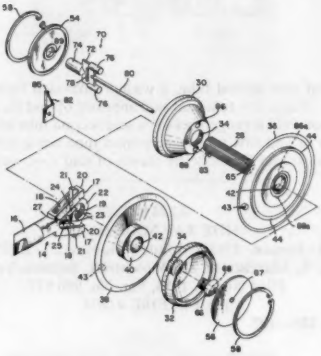
1. In a latch assembly of the type having a slide bolt slidable between extended and retracted positions, spring means urging the bolt into extended position, rollback means for retracting the bolt in opposition to the spring means and including a central boss for slidably receiving a spindle therethrough, a pair of escutcheons centrally aligned with said boss and adapted to interfit with a door and be held by the interfit against turning relative to the door, and a pair of hollow handles for manually operating the rollback means responsive to turning of the handles, the improvement comprising:

outwardly extending bosses on the escutcheons having matching journals therethrough aligned with said central boss and having outer annular faces;

said handles having back walls formed with rear annular faces opposing said boss outer faces, one of said handles having its back wall formed with a first splined through-opening registering with said journals;

said central boss having a second splined through-opening matching said first splined through-opening;

an externally splined hollow shaft journaled in said journals having its splines centrally interfitting with said second



splined through-opening, and interfitting near one end with said first splined through-opening, said shaft having its other end fixed at the center of the back wall of the other of said handles and not extending into the cavity of such other handle, said shaft having its splines directly journaled in the journal of the escutcheon adjoining said one handle; and

fastening means in the cavity of said one handle and screw-connected to said one end of the shaft for keeping said one handle on the shaft and the rear annular faces of the handles closely adjacent the outer annular faces of the escutcheon bosses, said fastening means having a center opening therethrough.

4,223,930

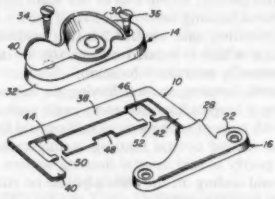
SECURITY DEVICE FOR WINDOW LOCKS

Michael Costello, East Boston, and John E. Costello, Saugus, both of Mass., assignors to Meridian Safety Products, Inc., Boston, Mass.

Filed Jan. 4, 1979, Ser. No. 823

Int. Cl.[2] E05C *3/38*

U.S. Cl. 292—346 **5 Claims**



1. A guard for use with the existing lock elements of a double-hung window having upper and lower sashes, both with a cooperating lock element, comprising

(a) a unitary flat plate number adapted to be mounted be-

tween the top of said lower sash and the lower sash lock element,

(b) said member being substantially flat throughout and including a main body portion formed with a contoured profile along one along edge thereof,

(c) said one long edge including a pair of spaced parallel fingers extending one from each end of said one long edge and of equal length adapted to extend over the gap between said sashes when closed and beyond the inner opposing edge of said upper sash and to either side of the upper sash lock element,

(d) said body portion being formed with a pair of spaced reentrant slot openings, one near each end thereof extending parallel to one another and originating at said one long edge in position to align with screw holes in said lower sash and said lower sash lock element and allow said guard to be slipped into position by loosening said lower sash look element,

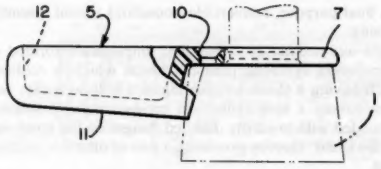
(e) said body portion being thinner in the area towards said one long edge and thicker in the area towards the other long edge whereby a lock element placed thereon will be tilted towards said one long edge.

4,223,931

DOORKNOB ATTACHMENT

Ralph E. Neary, San Francisco, Calif., assignor to Schlage Lock Company, San Francisco, Calif.

Filed Jun. 25, 1979, Ser. No. 51,612
Int. Cl.³ E05C *21/00*
U.S. Cl. 292—347 **6 Claims**



1. An operating lever for a conventional doorknob comprising:

a mounting portion for mounting said operating lever to a doorknob;

a lever secured to said mounting portion;

said mounting portion being substantially secured by screw means to the back face of a conventional doorknob so as not to mar the estetic design of the doorknob;

said mounting portion surrounding the stem of the doorknob for added support;

said lever projecting forwardly from the plane of the door in a direction from the mounting portion of said doorknob lever; and

said lever portion is provided with a convex curved surface facing said doorknob and in close proximity to said doorknob to minimize the possibility of a pinch point between said operating lever and said doorknob.

4,223,932

MECHANIC'S LIFTING DEVICE

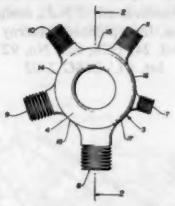
Almiro Gonsalves, 660 Garside Ct., San Leandro, Calif. 94579

Filed Dec. 28, 1978, Ser. No. 973,880
Int. Cl.³ B66C *1/10*
U.S. Cl. 294—1 R **1 Claim**

1. A mechanic's lifting device comprising:

a toroidal-shaped supporting member having an annular load-bearing wall dimensioned for engagement by a lifting hook or the like;

an odd-numbered plurality of threaded studs of different sizes mounted on and extending radially outwardly from said wall for threading into an object to be lifted, said studs being positioned in equal circumferentially spaced relation on said wall and with a plurality of hookengageable areas disposed in diametrically opposed relation to said studs with one such area diametrically opposed to each of said studs.

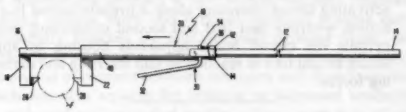


4,223,933

LOCKING TONG FOR HANDLING FUEL

Peter P. Yurik, Rte. 1, Box 111, Woodford, Va. 22580

Filed Mar. 1, 1979, Ser. No. 16,493
Int. Cl.³ A47J *49/14*
U.S. Cl. 294—11 **9 Claims**



1. A locking tong apparatus for securely grasping variable size fireplace or furnace fuel, comprising:

an elongate arm having a handle end and a remote end, a first, fixed gripper element being provided at said remote end;

a second, movable gripper element;

a carrying member for said second gripper element, said carrying member being slideably mounted on said arm and adapted to be manually moved along substantially the entire length thereof between said handle end and said remote end;

said first and second gripper elements defining a jaw for gripping the fuel;

locking means on said carrying member for selectively locking said carrying member into a position on said arm to securely grasp and retain the fuel in said jaw;

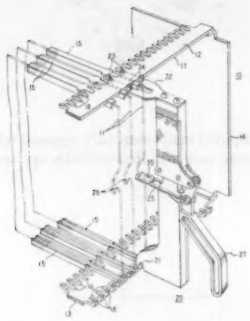
said locking means comprising a lever having an elongate arm-surrounding portion formed on one end thereof; said arm-surrounding portion being pivotable between a first, unlocked position and a second, locked position, and said arm-surrounding portion being coaxial with said arm in the first position and being non-coaxial with said arm in the second position, said arm-surrounding portion includng means for biting into opposite outer surface portions of said arm in said locked position.

4,223,934

TOOL TO INSERT AND EXTRACT PRINTED CIRCUIT BOARDS INTO AND OUT OF APPARATUS HOUSING CONNECTORS

Walter B. Cauceglia, Wayne; Walter H. Dieterle, Sparta, and Gerald B. Fay, Cranford, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 24, 1978, Ser. No. 927,104
Int. Cl.[3] B65G 7/02
U.S. Cl. 294—15 12 Claims



1. A tool (20) for inserting and extracting circuit boards (11) into and out of a circuit board apparatus housing (10), wherein the improvement comprises:

first and second connecting means (21, 22) at ends of the tool and operative to positively interlock with corresponding structural parts (12, 13) of said apparatus housing;

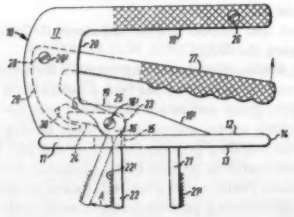
a driving mechanism (25, 27) adapted to engage a circuit board and operative to apply inserting and extracting forces thereto greater in magnitude than activating forces applied to said driving mechanism by translating an added distance of the activating force into an added magnitude of the inserting and extracting forces, said inserting and activating forces operating along a predetermined line of action, whereby said first and second connecting means permits the circuit board apparatus housing to apply forces to said tool in reaction to said inserting and extracting forces.

4,223,935

TOOLS

Basil M. Rayner, London, and David C. Evans, Sutton, both of England, assignors to Beachcroft Concrete Partitions Limited, London, England

Filed Jan. 17, 1979, Ser. No. 4,238
Claims priority, application United Kingdom, Jan. 18, 1978, 2041/78
Int. Cl.[3] B65G 7/12
U.S. Cl. 294—16 5 Claims



1. A tool for lifting a component comprising:

a support having a contiguous lower abutment surface,

a plurality of engaging members extending beneath said lower abutment surface and adapted to be entered into a recess in said component wherein at least one of said members is movable, and

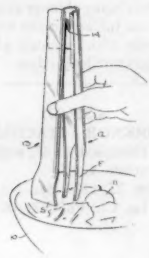
handle means movably connected with said support and operatively connected with said movable engaging member, the members engaging the adjacent wall of the recess with a force proportional to the weight of the component.

4,223,936

CONVERTIBLE HOUSEHOLD UTENSIL ASSEMBLY

Carsten Jorgensen, Koge, Denmark, assignor to Copco, Inc., New York, N.Y.

Filed Feb. 27, 1979, Ser. No. 15,583
Int. Cl.[3] A47G 21/02
U.S. Cl. 294—16 4 Claims



1. A dual purpose, convertible household utensil assembly comprising:

A first and second food handling implements formed of transparent synthetic plastic material which is resilient, each having a shank terminating in a hollow socket section having a semi-cylindrical cross-sectional formation provided with inwardly directed flanges on the inner side of the shank, thereby providing a pair of dilatable sockets; and

B a removable yoke formed of synthetic plastic material for interconnecting said implements, said yoke being constituted by a pair of legs having a corresponding cross-sectional formation insertable in said dilatable sockets and clamped thereby and a resilient ribbed cross-piece bridging said legs to define a hinge whereby when the yoke is joined to said implements, the resultant assembly functions as a tongs, the cross-piece having a thickness which is slightly less than the space between the flanges whereby the yoke is insertable to a depth which places the yoke below the ends of the socket sections, and when said yoke is removed therefrom, the implements are separately usable.

4,223,937

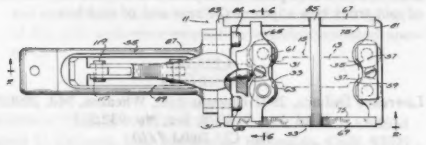
CONNECTING ROD CAP ALIGNMENT FIXTURE

John H. Winston, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 17, 1978, Ser. No. 887,479
Int. Cl.[3] B29C 17/02; B25B 7/12
U.S. Cl. 294—103 R 12 Claims

1. A fixture comprising a frame including a gauge portion having spaced ends, a first pair of angularly related wedge surfaces at one of said ends of said gauge portion, said first pair of wedge surfaces being provided by a first pair of rollers supported by a first pair of axles, resilient bushing means respectively supporting said first pair of axles from said frame, a handle portion extending from the other of said ends of said gauge portion, a subframe carried by said frame for movement toward and away from said first pair of wedge surfaces and including a second pair of angularly related wedge surfaces

located in spaced facing relation to said first pair of wedge surfaces, said second pair of wedge surfaces being provided by a second pair of rollers supported by a second pair of axles,



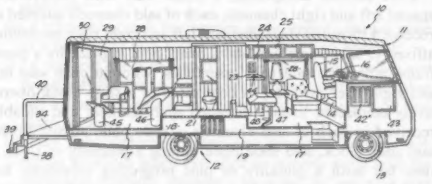
resilient bushing means respectively supporting said second pair of axles from said subframe, and means on said subframe and on said frame for moving said subframe relative to said first pair of wedge surfaces.

4,223,938

MOBILE SHOWROOM WITH LIVING QUARTERS

Raymond W. Born, 4211 First Street, Space 121, Santa Ana, Calif. 92703

Filed Sep. 25, 1978, Ser. No. 945,591
Int. Cl.[2] B60P *3/36*
U.S. Cl. 296—21 **3 Claims**



1. In combination, a mobile businessman's conference room; comprising;

a self-propelled motor coach having an elongated main body provided with non-transparent sidewalls having windows restricted to the upper portion thereof and a plurality of transparent panels crosswise of the end thereof one of which is a movably supported door for the passage therethrough of patrons of said conference room;

said coach having living accessories confined to one forward sidewall thereof including cooking facilities and an enclosed non-transparent bathroom;

the interior of said conference room being free and unobstructed by transverse partitions intermediate the opposite ends thereof and having a uni-level floor extending from a driver's station at the forward end thereof to said rear transparent panels thereby providing a businessman's conference room occupying the major portion of the length and breadth of said coach; and

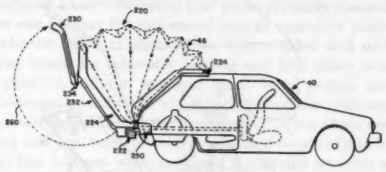
a combined protective shield for the transparent panels across and exteriorly of the rear of said conference room and an entranceway for patrons of said conference room, said combined shield and entranceway being pivotally supported crosswise of the rear end of said conference room and pivotable between a retracted upright protective position closely beside the exterior of said rear transparent panels and an extended generally horizontal position crosswise of and adjacent the level of the lower end thereof for the passage thereover of patrons entering and leaving said conference room.

4,223,939

ATTACHMENT FOR CONVERTING A VEHICLE INTO AN EXPANDIBLE VEHICLE

George Beggs, 25 Sommerlyn Rd., Apt. No. 804, Colorado Springs, Colo. 80906

Filed Oct. 24, 1978, Ser. No. 954,887
Int. Cl.[2] B60P *3/34*
U.S. Cl. 296—26 **12 Claims**



1. An attachment for converting a vehicle into an expandable vehicle, said vehicle having a vehicle body defining an outer configuration for the vehicle, said vehicle body comprising a stationary body frame; said attachment comprising an extension shell, a body panel member attached to said extension shell, and means for joining said extension shell to said stationary body frame along a pair of confrontable edges disposed in a plane defining the diagonal of an original enclosed usable volume, said joining means comprising a collapsible accordion type hood and means pivotally connecting said extension shell to said stationary body frame for pivotal movement about a pivot axis, said extension shell being pivotally movable about said pivot axis through an angle of substantially 90° from a closed position in which said confrontable edges substantially confront each other and said accordion type hood is collapsed to provide said original enclosed usable volume to an open position in which said accordion type hood is expanded to provide an enclosed expanded usable volume, said pivot axis being in a base plane through which said diagonal defining plane extends, said extension shell in said closed position substantially defining a half volume for said originally enclosed volume with said original enclosed volume being substantially bisected by said diagonal defining plane, said accordion type hood circumscribing a path of travel during said pivotal movement between said open and closed positions which describes an arch for creating an increased headroom for said enclosed expanded usable volume over that of said original enclosed volume while providing a total enclosed expanded volume greater than twice that of said original enclosed usable volume in said open position; whereby substantially the total vehicle enclosed volume may be used in both the open and closed positions of the extension shell with an increase in both headroom and volume being provided in the open position of the extension shell.

4,223,940

GLOVE COMPARTMENT LID FOR VEHICLES, OR THE LIKE

Joachim Janz, and Manfred Schneider, both of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

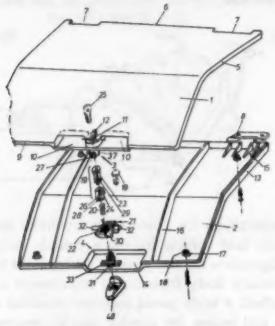
Filed May 25, 1978, Ser. No. 909,451
Claims priority, application Fed. Rep. of Germany, Jun. 18, 1977, 2727394
Int. Cl.[2] B60R *7/06*
U.S. Cl. 296—37.12 **20 Claims**

1. A lid for a glove compartment, or the like, comprising:

a first and a second plastic material lid half; said lid halves having spaced apart edges; hinge means on one said edge for enabling said lid to be hingedly attached to another object; at another said edge, both said lid halves being provided with respective bearing seats for receiving a closing device;

that said closing device being at said bearing seats; said closing device comprising:

a locking bar located between said lid halves and supported on said second lid half bearing seat; said locking bar including an engaging element for extending out of said second lid half toward the other object to which said lid is hingedly attached; biasing means for biasing



said locking bar engaging element to engage the other object;

pushbutton means supported on said first lid half bearing seat and operable to engage said locking bar and for urging said locking bar contrary to the bias of said locking bar biasing means; pushbutton means biasing means for biasing said pushbutton means away from engaging said locking bar.

4,223,941

TRUCK BOX AND COVER ASSEMBLY

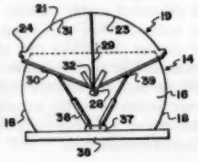
George Janzen, deceased, late of Winkler, Canada, and administratrix Janzen, Box 2080, Winkler, Manitoba, Canada (R0G 2X0)

Filed Oct. 13, 1978, Ser. No. 951,175

Claims priority, application Canada, Oct. 18, 1977, 288974

Int. Cl.[2] B60P *7/02*

U.S. Cl. 296—100 **6 Claims**



1. A truck box and cover assembly comprising in combination a planar floor, a front wall, a rear tailgate assembly and curved side walls extending between the side edges of said tailgate assembly and said front wall, a pair of curved cover panel assemblies mounted upon said side walls, means to mount said cover panel assemblies upon said truck box whereby said cover panel assemblies can be moved to an upwardly, closed position thereby substantially enclosing said truck box and to a downwardly open position, said cover panel assemblies lying spaced and parallel from said side panels when in the open position, and means to open and close said cover panel assemblies relative to said truck box, each of said cover panel assemblies including a segment shaped front panel, and a curved wall panel extending rearwardly from said segment shaped front panel, said segment shaped panel being situated exteriorly of said front wall of said truck box, said segment shaped front panels each including an upper meeting edge and a lower edge diverging from adjacent a common locus, said means to mount said cover panel assemblies upon said truck box including pivotally mounting said cover panel assemblies to said front wall of said truck box by adjacent said common locus of said segment shaped front panels, and roller means operatively connected between the rear end of the curved wall panel of each of said cover panel assemblies and the curved side walls of said truck box adjacent the rear end of said box.

4,223,942

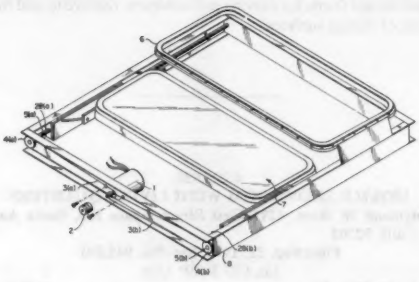
SUNROOF

Lawrence DeLuca, 2903 Dawson Ave., Wheaton, Md. 20902

Filed Aug. 9, 1978, Ser. No. 932,312

Int. Cl.[2] B60J *7/10*

U.S. Cl. 296—222 **3 Claims**



1. A sunroof comprising a frame unit with transversely spaced left and right channels, each of said channels adapted to receive a threaded shaft member, left and right riser assemblies affixed to said frame unit and a panel held in place by a panel frame affixed to said riser assemblies, wherein each said left and right riser assembly is comprised of a slide block operatively connected to said threaded shaft member and slidably received in each of said channels, a slide plate affixed to the said slide block, said slide plate having a plurality of slots, a riser bar with a plurality of pins projecting therefrom for movable engagement with said slots, and means for causing said riser bar to move relative to said slide block in a vertical plane.

4,223,943

POSITIONING DEVICE FOR REMOVABLE VEHICLE ROOF PANELS

Gary L. VanHulle, Woodhaven; Richard D. George, Wyandotte, and William A. Sims, Lincoln Park, all of Mich., assignors to American Sunroof Corporation, Southgate, Mich.

Filed Dec. 1, 1978, Ser. No. 965,284

Int. Cl.[3] B60J *7/18*

U.S. Cl. 296—224 **7 Claims**

1. A positioning and locking device for a removable vehicle roof panel comprising:

a first pin and a second pin, the pins being longitudinally movable in opposed directions;

the first pin being engageable with an aperture formed in a windshield post of a vehicle, the second pin being engageable in a second aperture formed in a headliner of a vehicle;

means for moving said first and second pins in the opposite directions;

a bushing for guiding and locating said first and second pins in a first direction; and

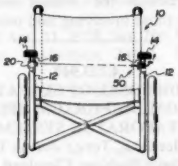
a plate including slots for adjusting the location of said first and second pins in a second direction to enable alignment of the pins with their respective vehicle-associated apertures.

4,223,944

RETRACTABLE WHEELCHAIR TRAY MECHANISM

Harold D. DeLong, 1483 Manzanita, Escondido, Calif. 92027

Filed Apr. 2, 1979, Ser. No. 25,999
Int. Cl.[2] A47B *39/00*
U.S. Cl. 297—148 **3 Claims**



1. A retractable tray for a wheelchair having frame and two armrests, said tray comprising:

(a) a roller mechanism and means to mount same to said frame adjacent one of said armrests and a return spring for said roller;

(b) a releasable catch mechanism and means to mount same to a portion of said frame opposite said first armrest;

(c) a resilient sheet mounted at one end to said roller and being coilable into a retracted position around said roller and extendable into an extended position engaged by said catch means;

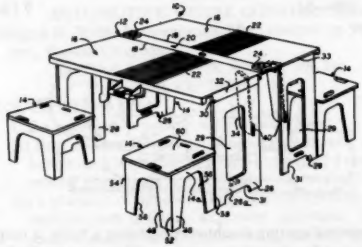
(d) said sheet defining a transverse upwardly convex arch across its width when extended to provide same with the structural strength necessary to pemit its use as a tray spanning the distance between said armrests without being under tension such that a one-armed or enfeebled person would be able to withdraw said mechanism against the spring load tension.

4,223,945

COLLAPSIBLE TABLE AND SEAT ASSEMBLY

Edwin Nikitits, Lachine, Canada, assignor to Franklyn M. Marcus, Montreal, Canada

Filed Apr. 10, 1978, Ser. No. 895,262
Int. Cl.[3] A47B *39/00, 3/00*
U.S. Cl. 297—159 **38 Claims**



1. A collapsible combined table and confronting seat comprising:

a relatively rigid plate-like table top having a pair of ends and a pair of sides;

a pair of legs pivotally connected to said table top along different sides thereof for movement between collapsed positions in which said legs are in close confronting parallel relation to said table top and operative positions in which they depend from said table top along different sides; and

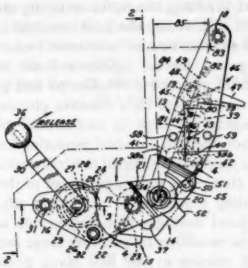
a collapsible seat comprising four plates pivotally connected to one another for movement into an operative position wherein said four plates define a three-sided wall with a top, means for releasably holding said four plates in said operative position, said four plates being pivotal into a collapsed condition in which they lie in close confronting parallel relation with one another, one of the plates defining said wall being pivotally connected to one of said legs, so that said seat when collapsed is pivotally movable into close confronting parallel relation with said one leg.

4,223,946

VEHICLE SEAT FITTING

Bernd A. Kluting, Radevormwald, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Filed Sep. 25, 1978, Ser. No. 945,303
Int. Cl.[2] A47C *1/025*
U.S. Cl. 297—363 **10 Claims**



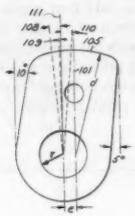
1. A hinge fitting for vehicle seats having a tiltable backrest member comprising a first hinge member connectable to a seat rest member, a second hinge member connectable to a backrest member, a first pivot means connecting said hinge members for relative pivoting movement, a locking plate pivotally mounted on said first pivot means capable of relative pivotal movement to both said first and second hinge members, a ratchet plate having a circular arcuate toothed sector, a second pivot means spaced from said first pivot means connecting said ratchet plate and first hinge member, a differential translation connection between said locking and ratchet plates spaced relatively more from said first pivot means and relatively less from said second pivot means, manually releasable toothed pawl means mounted on said first hinge member for engagement and retention of said toothed sector in any adjusted angular position of said ratchet plate relative to said first hinge member over the full range of operative backrest adjustment, and means for limiting backward movement of said second hinge member relative to said locking plate reflecting the adjusted position of said ratchet plate, said last means accommodating forward tilting movement of said backrest member without pivotal movement of said ratchet and locking plates.

4,223,947

HINGE FITTINGS FOR VEHICLE SEATS

Heinz P. Cremer, Remscheid, Fed. Rep. of Germany, assignor to Keiper Automobiltechnik GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Continuation of Ser. No. 905,358, May 12, 1978, abandoned.
This application Dec. 8, 1978, Ser. No. 967,623
Int. Cl.[2] A47C *1/025*
U.S. Cl. 297—367 3 Claims



1. Hinge fittings manufactured within production tolerances for vehicle seats having tiltable backrest members, each fitting including a first hinge member connectable to a seat rest member; a second hinge member connectable to a backrest member; pivot means connecting said hinge members for relative pivoting movement; arresting means for arresting said hinge members in selected relative angular positions, said arresting means comprising an annular member with teeth on a circular arcuate peripheral segment thereof rigidly secured to said second hinge member in concentric relation to said pivot means, a pawl having mating teeth on a concave circular arcuate segment for engaging the teeth on said annular member in any adjusted position thereof, a pivotal mounting for said pawl on said first hinge member positioned to accommodate disengagement and full concentric interengagement of the teeth on said respective mating segments for any given adjusted position thereof, said pawl having a cam engageable surface, a cam having a pivotal mounting on said first hinge member in triangularly spaced relation to said first pivot means and pivotal mounting for said pawl, means normally biasing said cam toward interengagement of said teeth in a given adjusted position, means for retracting said cam to accommodate disengagement of said teeth for readjustment of said relative angular position, said teeth having pressure angles subjecting said pawl to pivotal disengagement forces in response to relative pivoting forces between said first and second hinge members in either direction,

characterized by said named elements having manufacturing dimensional tolerances establishing an operative range of pivotal cam rise, necessary in assembled relation to take up all clearance with said teeth and cam fully engaged, extending throughout the cumulative extremities of said dimensional tolerances,

said cam having a circular arcuate face including said operative range of cam rise within a limited intermediate portion of said cam face, said pawl having a relatively more linear contact force than said cam face, and a line normal to the fully engaged contact between said cam and pawl extending past the pivotal center of said cam in spaced relation thereto a a substantial distance no greater than ten percent (10%) of the distance from said pivotal center to said contact at every possible position throughout said operative range.

4,223,948

PROCESS FOR THE REDUCTION OF COMPETITIVE OXIDANT CONSUMING REACTIONS IN THE SOLUTION MINING OF A MINERAL

Dennis E. Stover, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 27, 1977, Ser. No. 865,040
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—4 10 Claims

1. An improved method for the solution mining of a mineral from a subterranean formation containing same in which an injection and production well are drilled and completed within said formation, leach solution and an oxidant are injected through said injection well into said formation to dissolve said mineral, and said dissolved mineral is recovered via said production well, wherein the improvement comprises introducing into said formation a leach solution containing a chemical additive which reduces the oxidant consuming reactions therein other than those involving said mineral.

4,223,949

PROCESS FOR DISPOSAL OF SULFATE CONTAINING BRINES FROM DIAPHRAGM CELL CAUSTIC EVAPORATOR SYSTEMS

Jaswant S. Gill, Cleveland, Tenn.; Joseph L. Wood, Westminster, Md., and Nissim Rachima, Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Jan. 4, 1979, Ser. No. 857
Int. Cl.[2] E21B *43/28*
U.S. Cl. 299—5 8 Claims

1. A process for the disposal of an alkaline effluent solution containing sodium chloride, sodium sulfate and sodium hydroxide which comprises:

a. admixing said alkaline effluent solution for disposal with an aqueous solution to form a mining solution,

b. injecting said mining solution into a brine well to contact solid sodium chloride contaminated with a soluble calcium compound,

c. maintaining said mining solution in contact with said solid sodium chloride for a period sufficient to dissolve sodium chloride while inhibiting the solubility of said calcium compound to form a sodium chloride brine containing sodium sulfate, and

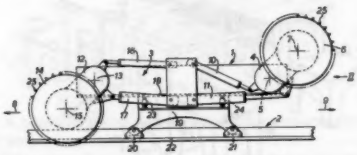
d. extracting said sodium chloride brine from said brine well having reduced concentrations of dissolved calcium.

4,223,950

LONGWALL CUTTING MACHINES WITH DRUM MOVED BY PLURAL POWER MEANS

Thomas G. Barr, Malvern, England, assignor to Dowty Meco Limited, Worcester, England

Filed Feb. 6, 1979, Ser. No. 9,811
Claims priority, application United Kingdom, Feb. 15, 1978, 5948/78
Int. Cl.[2] E21C *27/24*
U.S. Cl. 299—54 9 Claims



1. A mineral-cutting machine comprising a body, a ranging arm mounted for pivotal movement with respect to the body, a cutting device supported on the ranging arm for rotation about an axis extending away from the ranging arm in a direction transverse to the intended direction of movement of the

machine during a cutting operation, said cutting device being normally in a position at least partly beyond an end of the body during a cutting operation, and means, for moving said ranging arm, comprising first and second power-operated devices each of which is connected at one part thereof to said body at a respective position thereon, and each being connected at another part thereof to said ranging arm at a respective position thereon, said positions being so relatively disposed that said first and second devices, when operated, are together capable of moving the cutting device from said normal position at least partly beyond an end of the body to a position where it is at least substantially wholly alongside of said body.

4,223,951

MOUNTING STRUCTURE FOR A HUB CAP OR A WHEEL CAP

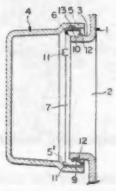
Tadao Muramatsu, and Katsuhiro Fujiwara, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Apr. 11, 1978, Ser. No. 895,386

Claims priority, application Japan, Nov. 1, 1977, 52-146603[U]

Int. Cl.[2] B60B *7/06*

U.S. Cl. 301—37 PB **4 Claims**



1. A structure for mounting a hub cap having an annular rim portion which provides a cylindrical bore to a wheel, comprising an annular element having a strap-like body which has a radially outside cylindrical surface having a diameter substantially equal to the diameter of said cylindrical bore of said rim portion, a number of elastic tongues made of flaps projected transversely from said body and spaced along said body and each folded into a hook shape, and a number of first and second oppositely directed detent portions transversely cut out from said body and spaced along said body, said hub cap having an annular groove which retains said first detent portions and an annular land portion which engages with said second detent portions when said annular element is mounted to said hub cap so that the radially outside cylindrical surface of said body engages with the cylindrical bore of said hub cap, said wheel including an annular groove for removably receiving said elastic tongues, wherein said hub cap is mounted to said wheel by way of said annular element interposed therebetween.

4,223,952

AUTOMOTIVE WHEEL CONSTRUCTION

Richard G. Weld, Independence, Mo., assignor to Weldwheels, Inc., Kansas City, Mo.

Filed Apr. 14, 1978, Ser. No. 896,246

Int. Cl.[2] B60B *1/06*

U.S. Cl. 301—63 DS **2 Claims**

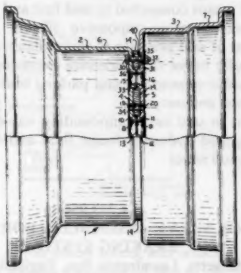
1. An automotive vehicle wheel comprising:

(a) first and second drawn sheet wheel halves, said wheel halves each including a center section and a rim section, a central opening in said respective center sections;

(b) a plurality of opposed integral projections in said center sections and defining alignment apertures, said center section alignment apertures being radially spaced from said central openings and forming congruent and correspondent pairs of alignment apertures, said projections having an outer surface generally parallel to the axis of said center section and facing ends closely spaced from one another;

(c) an alignment element including a disc plate positioned between said center sections, apertures in said disc plate;

(d) said center section projections being received into said disc plate a sufficient distance to produce a torque transmitting, substantially interlocked relationship between



said disc plate apertures and said projections, whereby said wheel halves and disc plate are engaged such that torque applied about the axis of one of said wheel halves is transferred through the interlocked disc plate and projections to the other of said wheel halves;

(e) means connecting said wheel halves; and

(f) means forming an airtight seal between said disc plate and each of said wheel halves.

4,223,953

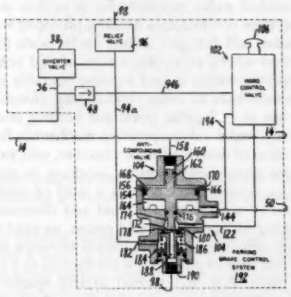
ANTI-COMPOUNDING BRAKE SYSTEM AND VALVE FOR HYDRAULIC CAM BRAKE ACTUATORS

Oliver B. Cruse, Florissant, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed Sep. 22, 1978, Ser. No. 944,698

Int. Cl.[2] B60T *13/22*

U.S. Cl. 303—2 **20 Claims**



1. A parking brake control system for operation with a hydraulic brake system which uses hydraulic brake fluid, comprising:

(a) means for providing pressure of a fluid;

(b) relay valve means for connecting a metered amount of said pressure from its input to its output in proportion to pressure at a control line, the fluid at said output being connected to a parking brake line;

(c) control means having first and second conditions for connecting said fluid pressure to said control line in said first condition and for connecting an exhaust line to said control line in said second condition;

(d) anti-compounding valve means for receiving said hy-

draulic brake fluid at a first connection and said fluid at a second connection;

(e) first and second connected opposed pressure-responsive means in said anti-compounding valve means acted on in opposed directions by said hydraulic brake fluid and the fluid connected to said parking brake line respectively and displaceable therein according to the relative fluid pressure thereupon;

(f) valve means connected to said first and second connected opposed pressure-responsive means for metering an amount of said pressure to said exhaust line in response to hydraulic brake fluid pressure exceeding the pressure of the fluid connected to said parking brake line by a predetermined amount; and

(g) means in said anti-compounding valve means for maintaining said hydraulic brake fluid and said fluid isolated from each other.

4,223,954

CONTROL VALVE ASSEMBLIES FOR HYDRAULIC BRAKING SYSTEMS

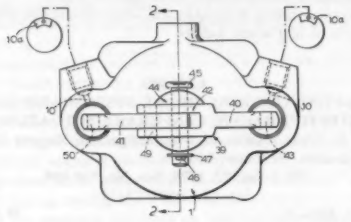
Hugh G. Margetts, Leamington Spa, England, assignor to Girling Limited, Birmingham, England

Filed May 25, 1978, Ser. No. 909,471

Claims priority, application United Kingdom, May 25, 1977, 21957/77; Aug. 23, 1977, 35203/77

Int. Cl.[2] B60T *15/06*

U.S. Cl. 303—6 A **4 Claims**



1. A control valve assembly for a vehicle dual hydraulic braking system comprising a housing provided with a distributor chamber, and first and second outlet ports for connection to brakes on wheels on opposite sides of said vehicle, separate brake-applying valves in said housing operable independently and simultaneously to cause fluid in said chamber to be supplied to one of said outlet ports and both of said outlet ports respectively, and a valve operating mechanism for controlling pressurisation of said distributor chamber, said valve operating mechanism comprising a piston working in said distributor chamber, a recuperation port in a wall of said housing for connection to a reservoir for fluid and communicating with said chamber on one side of said piston, an axial bore through said piston providing communication between said recuperation port and an inlet passage for connection to a source of high pressure fluid, first and second axially spaced seatings, an axially movable valve member for alternate engagement with said first and second axially spaced seatings, said first seating comprising a seating surrounding said bore in said piston and said second seating leading to said inlet passage, said axially movable valve member having a first end defining a face for engagement with one of said seatings and a second opposite end carrying a head for engagement with the other of said seatings, and a spring for urging said valve member normally into engagement with said second seating with said valve member spaced from said first seating, initial axial movement of said piston in response to an inwardly directed valve-operating force urging said first seating into engagement with said valve member to isolate said distributor chamber from said recuperation port, and subsequent movement of said piston in the same direction displacing said valve member away from said second seating whereby pressure fluid from said inlet passage is admitted to said distributor chamber.

4,223,955

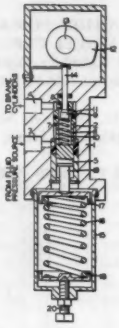
LOAD-DEPENDENT BRAKING FORCE CONTROL DEVICE

Erich Reinecke, Beinhorn, Fed. Rep. of Germany, assignor to WABCO Westinghouse GmbH, Hanover, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 916,033

Int. Cl.[2] B60T *8/22*

U.S. Cl. 303—22 R **10 Claims**



1. A vehicle load-responsive braking force control device comprising:

(a) a supply valve member for controlling flow of brake-applying fluid pressure between an inlet port and an outlet port;

(b) a valve seat member having formed thereon a valve seat normally occupying an open position at a spaced-apart distance relative to said valve member for opening communication between said inlet and outlet ports, and being operable to a closed position relative to said valve member for closing said communication;

(c) a radially variable disc-type cam member rotatably and angularly positionable according to vehicle load;

(d) a stem operably interposed between the cam member and the valve member with one end secured to the valve member and the other end making separable contact with the cam member,

(e) said cam member and said stem cooperating for positioning said valve member at said spaced-apart distance in accordance with the angular position of the cam determined by vehicle load; and

(f) spring means characterized by a progressive compression rating for biasing said valve seat member toward said open position, said valve seat member being subjectable to said fluid pressure for exerting a force thereon in opposition to said spring means and effective for operating said valve seat member to its said closed position when the force of said fluid pressure exceeds that of the spring means.

4,223,956

HYDRAULIC BRAKE PRESSURE CONTROL DEVICE FOR VEHICLE BRAKING SYSTEMS

Tomoyuki Nogami, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Mar. 19, 1979, Ser. No. 21,766

Claims priority, application Japan, Nov. 28, 1978, 53-146826

Int. Cl.[3] B60T *8/14*

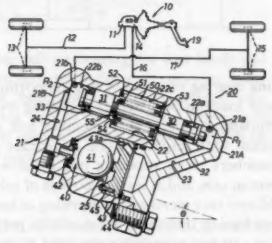
U.S. Cl. 303—24 C **3 Claims**

1. In an hydraulic brake pressure control device for a vehicle

braking system incorporating between a master cylinder and wheel brake cylinders, comprising:

a housing adapted to be mounted on a vehicle body frame, said housing being provided thereon with an inlet port for connection to said master cylinder and an outlet port for connection to said wheel brake cylinders and being provided therein with a stepped bore having a small diameter portion and a large diameter portion, said stepped bore being in communication with said inlet and outlet ports respectively at the small and large diameter portions thereof, and an inner bore in communication with the small and large diameter portions of said stepped bore at opposite sides thereof;

a differential piston having small and large diameter portions reciprocably disposed within the respective small and large diameter portions of said stepped bore to provide first and second fluid chambers respectively in open communication with said inlet and outlet ports, said piston being exposed at its small diameter portion in said first chamber and at its large diameter portion in said second chamber;



resilient means for regulation axial movements of said differential piston; and

cut-off valve means including a valve seat provided on a wall of said inner bore to permit fluid flow between said first and second chambers and an inertia-controlled valve element housed within said inner bore to co-operate with said valve seat to interrupt the flow of fluid from said first chamber to said second chamber when said valve element is subjected to a deceleration in excess of a predetermined value;

the improvement wherein said housing includes a space between the small and large diameter portions of said stepped bore, and said resilient means comprises first and second coil springs concentrically assembled within said space, said first spring being loaded to regulate the axial movement of said piston towards said first fluid chamber from the usual position, and said second spring being loaded to regulate the axial movement of said piston toward said second fluid chamber from the usual position.

4,223,957

ANTI-LOCK BRAKE CONTROL SYSTEM I

Malcolm Brearley, Solihull, and Alfred K. White, Birmingham, both of England, assignors to Girling Limited, Birmingham, England

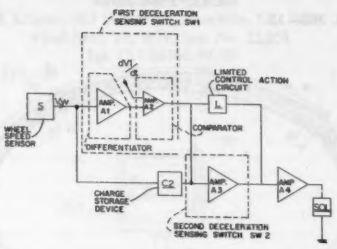
Filed Apr. 5, 1978, Ser. No. 893,798

Claims priority, application United Kingdom, Apr. 5, 1977, 14240/77

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—106 **11 Claims**

1. An anti-lock brake control system for vehicles with braked wheels comprising a wheel speed sensor for producing a signal proportional to wheel speed; a first switch having an input connected to the sensor to receive the wheel speed signal and being adapted to respond to the rate of change of said signal so as to produce a first control pulse to effect brake pressure release while a preset first wheel deceleration threshold is exceeded; a second switch that is triggered under the control of the first control pulse and which, when triggered initiates a second control pulse to effect brake pressure release; and a charge storage device that receives the wheel speed signal so that it accumulates a charge dependent on the dip in wheel speed and discharges in response to wheel speed recovery following said dip in wheel speed, and which is associated with the first and second switches so that it discharges in a predetermined manner after the first control pulse terminates and terminates the second control pulse when the stored charge falls to a predetermined level.



4,223,958

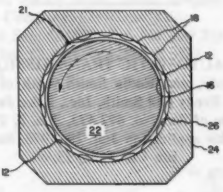
MODULAR COMPLIANT HYDRODYNAMIC BEARING WITH OVERLAPPING BEARING SHEET

Stanley Gray, Skaneateles, N.Y., assignor to Mechanical Technology Incorporated, Latham, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,254

Int. Cl.³ F16C *32/06*

U.S. Cl. 308—9 **24 Claims**



7. A compliant hydrodynamic fluid film journal bearing for rotatably supporting a rotating rotor within a bearing sleeve, comprising:

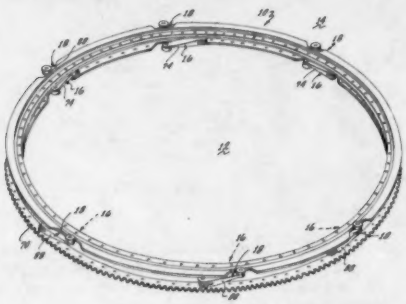
at least one bearing module having a resilient supporting section and a bearing sheet attached adjacent one end of said supporting section, and extending forwardly therefrom over the adjacent free end of the adjacent underlying supporting section, overlapping and overlying and supported by said adjacent supporting section, and terminating in a free end which overlies the area of the junction of said underlying, overlapped supporting section and its attached bearing sheet, said supporting section having a length substantially equal to an integer fraction of the inner circumference of said sleeve, the denominator of said fraction being equal to the number of modules, and said bearing sheet having a length approximately equal to the length of said supporting section, and overlapping only one resilient support section and overlapping said one resilient support section only once; said resilient section including a plurality of raised resilient elevations which are more compliant than the fluid film.

4,223,959

TEMPERATURE COMPENSATING BEARING SUPPORT

Oliver F. Oldendorph, Coronado, Calif., assignor to General Dynamics, San Diego, Calif.

Filed Apr. 4, 1979, Ser. No. 26,959
Int. Cl.[3] F16C 35/04
U.S. Cl. 308—15 5 Claims



1. A bearing assembly including bearing means and mounting means having a relatively high coefficient of expansion for connecting rotatable structures of low coefficient of expansion material, comprising;

means for loosely connecting said bearing assembly to each of said rotatable structures so that expansion and contraction of said bearing assembly due to temperature variations is independent of its connected structures; and

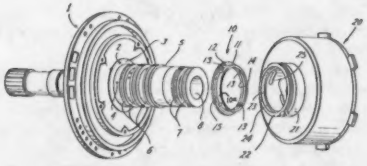
means pivotly connecting said bearing assembly to each of said rotatable structures to restrain axial translation of the bearing assembly in the plane of the bearing assembly yet permit radial movement thereof due to temperature variations.

4,223,960

AUTOMATIC TRANSMISSION

Lonnie T. Reedy, and Eddie Smith, both of Freeport, Tex., assignors to Reedy and Smith, Inc., Lake Jackson, Tex.

Continuation of Ser. No. 692,432, Jun. 3, 1976, Pat. No. 4,098,382. This application Jun. 29, 1978, Ser. No. 920,185
Int. Cl.[3] F16C 33/66
U.S. Cl. 308—78 3 Claims



1. A combination thrust-washer/radial-bushing having the configuration of a short cylinder with a flanged end,

said short cylinder being the radial-bushing portion and said flanged end being the thrust-washer portion,

said radial-bushing having an oil-conveying groove inscribed around its inner periphery and having at least one oil passageway communicating with its outer periphery, and

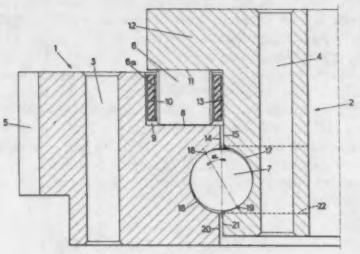
said thrust-washer portion having an oil-conveying groove inscribed around the surface which faces the radial-bushing.

4,223,961

ORIENTATION RING WITH BEARINGS

Joachim Martinez, Avallon, France, assignor to R.K.S., Avallon, France

Filed Jun. 6, 1978, Ser. No. 913,219
Int. Cl.[2] F16C 19/49
U.S. Cl. 308—174 4 Claims



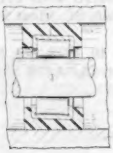
1. A rolling bearing orientation ring supporting radial loads and also axial loads in both senses including overtuning moments, comprising an outer race member and an inner race member coaxial with respect to said outer race member, said two race members being rotatable one relative to the other about a common axis, and at least two rows of rolling members between said two race members, comprising at least one row of thrust rollers having their axes substantially perpendicular to said common axis and supporting the axial loads in one sense and a row of rolling members with an oblique contact supporting the radial loads and the axial loads in the other sense, said two race members each being unitary and the outer race member having an inner substantially cylindrical surface provided, at one end, with an annular recess having one flank substantially transverse to said common axis and forming one race of said row of thrust rollers, the inner race member having, facing said inner cylindrical surface and said recess, an outer substantially cylindrical surface whose diameter is slightly smaller than the diameter of said inner cylindrical surface, and provided beyond said end of the outer race member with an annular portion projecting radially outwardly and having one flank substantially transverse to said common axis, facing axially said flank of said recess and forming the other race of said row of thrust rollers, a first groove in said inner cylindrical surface of said outer race member between said flank of said recess and the other end of the outer race member, said first groove forming one race for said row of rolling members with oblique contact, a second groove in said outer cylindrical surface of the inner race member, between said flank of said annular portion and the other end of the inner race member, said second groove forming the other race for said row of rolling members with oblique contact, said inner cylinder surface of said outer race member and said outer cylindrical surface of said inner race member each being two cylindrical surfaces having different diameters and situated respectively on opposite sides of the groove of each race member, the inner cylindrical surface of the outer race member having a smaller diameter between said recess and groove than between said groove and said other end, and the outer cylindrical surface of the inner race member having a greater diameter between said other end and said groove than between said groove and said annular portion, the diameter of said smaller diameter cylindrical surface of the outer race member being slightly greater than the diameter of said greater diameter cylindrical surface of the inner race member, and one at least of said race members being provided with a fill hole for the introduction of the rolling members with oblique contact between said two grooves.

4,223,962

PLAY-FREE ROLLING BEARINGS FOR LOW LOADS AND LOW RPMS

Jörg Zielfleisch, Stuttgart, Fed. Rep. of Germany, assignor to Industriewerk Schaeffler OHG, Herzogenaurach, Fed. Rep. of Germany

Filed Oct. 3, 1977, Ser. No. 838,498
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1976, 2645958
Int. Cl.[2] F16C *27/00, 27/06*
U.S. Cl. 308—184 R 12 Claims



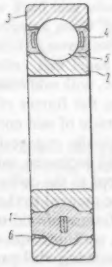
1. A play-free rolling bearing for low loads and low rpms comprising two structural elements carrying inner and outer raceways with interposed rolling elements, one structural element carrying one of the raceways being inclined to the other structural element so that the axes of both raceways are at an angle to each other.

4,223,963

ANTIFRICTION BEARING, METHOD OF MAKING SAME AND ANTIFRICTION MATERIAL FOR PERFORMING THIS METHOD

Jury N. Glodin, pereulok Frunze, 4, kv. 12; Albert G. Eliseenko, Privokzalnaya ulitsa, 19, kv. 48, both of Pavlovsky Posac Moskovskoi oblasti; Petr A. Pshenichkin, Tsentralnaya ulitsa, 4, kv. 6; Evgeny A. Smirnov, ulitsa Mayakovskogo, 3, kv. 8, both of Elektrougli Moskovskoi oblasti; Nikolai N. Khavsky, ulitsa Gubkina, 4, kv. 73, and Lev B. Kuznetsov, ulitsa Pljuschikha, 42, korpus 1, kv. 47, both of Moscow, all of U.S.S.R.

Filed Jul. 27, 1978, Ser. No. 928,693
Claims priority, application U.S.S.R., Aug. 1, 1977, 2505001
Int. Cl.[2] F16C *19/00*
U.S. Cl. 308—188 8 Claims



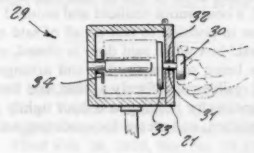
1. An antifriction bearing, comprising
an inner race;
an outer race spaced from said inner race;
a metal annular cage located between said races and having a plurality of sockets;
a plurality of rolling bodies loosely received in said sockets of said cage and separating said races, said rolling bodies, said cage and said races together forming an unoccupied space therebetween; and
a body of antifriction solidified compound filling said unoccupied space and being fast only with said metal cage so that the latter is embedded in and acts as reinforcement of said body of antifriction solidified compound.

4,223,964

TISSUE HOLDER

Bobby R. Kilgore, 603 School St., Rossville, Ga. 30741

Filed Mar. 19, 1979, Ser. No. 22,051
Int. Cl.[3] B65H *19/00*
U.S. Cl. 312—39 1 Claim



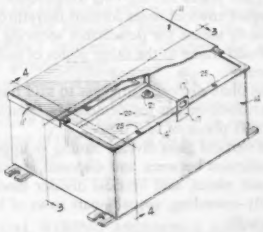
1. A tissue holder, comprising, in combination, a cylindrical case having an end wall at its one end, and an opening at its opposite end, a pivotable door closing said opening, a straight peg in the center of said case, secured at its one end in said end wall, said peg supporting a roll of toilet tissue, said case having a slot along a side thereof, through which said tissue is dispensed, and means for support of said case in a bathroom, said means comprising a pedestal post upon a broad base, and a flat, circular friction plate depressible against an end wall of said roll, for selective rotation thereof, said friction plate being inside said case and affixed on a shaft extending through a central opening of said door, and a knob on an exterior end of said shaft for axial movement of said friction plate against said roll, and rotation thereof.

4,223,965

WALL CABINET

Joseph Palandrani, Rocky River, Ohio, assignor to American Metal Forming Company, Cleveland, Ohio

Filed Sep. 5, 1978, Ser. No. 939,202
Int. Cl.[2] A47B *81/00, 43/00*
U.S. Cl. 312—100 1 Claim



1. An oil-, dust- and waterproof enclosure of steel consisting of a box comprising a single retangular sheet bent at right angles at each end providing a bottom wall at one end and a top wall at the other end and a back wall between the top and bottom walls, said bottom wall having an end edge flange bent inwardly at right angles a predetermined distance from said back wall, said top wall having an end edge flange bent outwardly at right angles at the same predetermined distance from said back wall, two rectangular side walls composed of a single sheet for each, each side wall having a continuous planar edge flange aroung its four edges except for a slight space at the uppr front edge at the zone of the open front, each side wall having a width from front to back equal to the distance from the inner face of the back wall to the outer face of said first

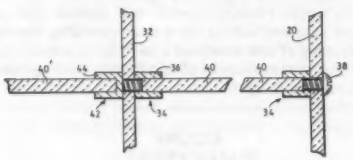
named end edge flanges, each side wall having a length from top to botom equal to the distance between the inner faces of said top wall and bottom wall, said side wall edge flanges being flat against and there welded to the inner faces of the contiguous top wall and bottom wall and back wall entirely on the inside of said enclosure, said side wall edge flanges being welded to said end edge flanges at their contact zones, said edge flanges at the face of said box spaced from said back wall being formed flat and coplanar, a flat rectangular door having inturned edges positioned to fit snugly over said edge flanges at said face of said box, a continuous hinge permanently connecting one edge of said door to one of said side walls along the entire side wall, a continuous resilient seal secured to the inner face of said door in position to rest on all of said edge flanges at said face of said box when said door is closed, said box and door and hinge being so constructed and arranged that said door holds said resilient seal firmly against said box when said door is closed, means for holding said door tightly against said box in closed position, and means for mounting said enclosure on a support.

4,223,966

GLASS DISPLAY CASE

Albert C. Winters, Mill Neck, N.Y., assignor to Manhattan Store Interiors, Inc., Brooklyn, N.Y.

Filed Jun. 4, 1979, Ser. No. 44,854
Int. Cl.[2] A47F *3/06, 3/12;* F16B *12/12*
U.S. Cl. 312—140 **6 Claims**



1. An adjustable glass display case, which permits ready assembly and disassembly, comprising:

a frame including four glass plates, a generally horizontally-disposed top plate, a generally horizontally-disposed base plate and two upstanding, spaced-apart side plates disposed generally between said top and bottom plates each of said glass plates having two longitudinally-extending, spaced-apart rows of holes formed therethrough;

first friction-fit means for detachably securing each of said plates of said frame to the other plates of said frame adjacent thereto;

a back glass plate disposed adjacent to said frame;

second friction-fit means for detachably securing said back plate to said plates of said frame;

at least one vertical glass divider having an upper and lower edge positioned between and disposed generally parallel to said side plates, said vertical divider having two longitudinally-extending, spaced-apart rows of holes formed therethrough;

means for detachably securing the upper and lower edges of said vertical divider to said top plate and bottom plate, respectively, said means being at least partially retained within at least one of said holes of said top and bottom plates, said means for detachably securing the upper and lower ends of said vertical divider including at least one pair of plastic, resilient first clamping assemblies, each of which comprises a U-shaped clamp having a base with an internally-threaded bore extending therethrough and two spaced-apart arms extending outwardly from said base which are configured and dimensioned for frictionally receiving an edge of said divider therebetween, said clamping assembly also including a screw threadably receivable in said bore of said base of said clamp;

at least one glass shelf having opposite lateral edges disposed between said vertical divider and one of said side plates; and

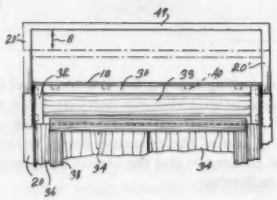
means for detachably securing the opposite lateral edges of said shelf to one of said side plates and said vertical divider, said means being at least partially retained within at least one of said holes of said side plate and said vertical divider.

4,223,967

TELESCOPIC STRUCTURAL ELEMENT FOR MAKING MODULAR CLOSETS, PARTITION WALLS, DOOR SUPPORTS AND THE LIKE

Antonio Royer, 601 Wolfe St., Mont St. Hilaire, Quebec, Canada (J3H 2P2)

Filed May 10, 1978, Ser. No. 904,391
Int. Cl.[2] A47B *55/00*
U.S. Cl. 312—245 **4 Claims**



1. A prefabricated modular closet for permanent installation in a room, comprising several separate units adapted to be permanently secured together to form an enclosure with a front opening, said units including a floor unit, two side wall units, a back wall unit, a ceiling unit, a front lintel unit and a back and a front telescopic unit, said floor unit and ceiling unit consisting of a flat floor panel and flat ceiling panel respectively, said side wall units, said back wall unit and said lintel unit each consisting of a structural frame with a flat panel secured to one face of said frame, said telescopic units each consisting of an inverted U-shaped frame defining a top transverse member and depending legs; snap action clip means for securing said floor panel to the underside of the frames of said back wall unit and of said side wall units, for securing said ceiling panel to the top side of said back wall unit, of said side wall units and of said lintel unit, and for securing said back wall unit to said side wall units, said back wall unit, said side wall units and said lintel unit, when assembled by said clip means and positioned in a room having their respective panels together with the floor panel and ceiling panel defining the surfaces of said enclosure, with said ceiling panel spaced below the ceiling of the room, the frames of said last named units being located on the outside of said enclosure, the legs of said telescopic units telescopically engageable with said frames at the front and back of said enclosure, said top transverse members adapted to be secured to the ceiling of the room and said floor panel adapted to be secured to the floor of the room, the external surface of the frames of said telescopic units, of said lintel unit, of said back wall unit and of said side wall units forming a backing for securing wall panelling thereto.

4,223,968

HIGH-FREQUENCY ETCHED CIRCUIT BOARD CONNECTOR

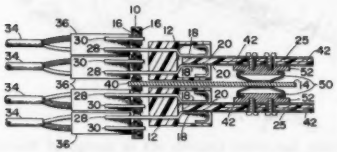
Frederick Y. Kawabata, Beaverton, and William M. Wane, Portland, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed May 8, 1979, Ser. No. 36,968
Int. Cl.[3] H05K *1/07, 1/12*
U.S. Cl. 339—14 R **1 Claim**

1. An electrical connector apparatus providing a bypass ground connection to an etched circuit board, comprising:

a back plane member having at least one metallic planar surface;

at least one circuit board edge connector assembly attached to said back plane member, said edge connector assembly comprising an insulative body containing contraposed rows of electrical contacts for resiliently engaging the edge of an etched circuit board having metallic pads along said edge, said edge connector assembly further comprising a set of first electrical connector pins electrically connected with respective ones of said electrical contacts extending through holes provided in said back plane member and insulated therefrom to provide signal paths;



a set of second electrical connector pins electrically connected to said back plane member to provide ground connections, said second pins being disposed adjacent said first pins to provide pairs of ground and signal pins; and

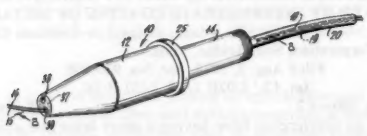
a bypass ground plane member mounted perpendicular to said back plane member and making electrical connection with the metallic planar surface thereof, said bypass ground plane member being disposed adjacent to the insulative body of said edge connector assembly and extending from the back plane member parallel to the etched circuit board to engage ground contacts carried by the circuit board.

4,223,969

QUICK CONNECT-DISCONNECT ELECTROFLUIDIC JUNCTION ASSEMBLY

Roland Gatturna, Walpole, Mass., assignor to Codman & Shurtleff, Inc., Randolph, Mass.

Filed Apr. 20, 1979, Ser. No. 31,719
Int. Cl.³ H01R *4/64*
U.S. Cl. 339—15 **10 Claims**



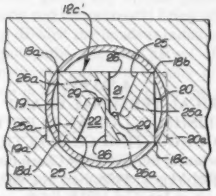
1. A quick connect-disconnect electrofluidic junction assembly for simultaneously transferring fluid and electrical energy from respective sources of supply comprising a female terminal and a male terminal, said female terminal including: a hollow housing defining an internal receptacle, one end of said receptacle being open, said receptacle being defined by a peripheral wall on the housing surrounding said receptacle; an electrical contact having at least two electrically separated contact elements thereon, said contact positioned inside said housing and spaced apart from said open end; means through said housing for making an electrical lead connection to each of said two contact elements on said contact; and fluid passage means through said housing and communicating with said receptacle; and said male terminal including: a hollow connector body having a cross-sectional dimension slightly smaller than the cross-sectional dimension of said receptacle so that said body may slidably fit into said receptacle through the open end thereof; an electrical contact having at least two electrically separated contact elements positioned on the forward end of said body adapted to mate for electrical connection purposes with said electrical contact in said housing; means around the periphery of said body for providing a fluid-tight seal between said body and the interior wall of said housing when slide-fit therein; a fluid channel through said body between its forward end and said peripheral sealing means, said channel communicating with the hollow interior of said body and adapted to receive fluid from said receptacle; an opening through said body communicating with said hollow interior of said body for the passage of fluid therethrough, said opening being located rearward of said peripheral sealing means; and means through said body for making an electrical lead connection to each of said two contact elements on said contact at the forward end of said body.

4,223,970

COMPLIANT BACKPLANE ELECTRICAL CONNECTOR

Leo Walter, Palos Verdes Peninsula, Calif., assignor to Electronics Stamping Corporation, Compton, Calif.

Filed Feb. 26, 1979, Ser. No. 15,450
Int. Cl.³ H05K *1/04*
U.S. Cl. 339—17 C **11 Claims**



1. In a compliant electrical connector adapted to be pressed into a hole formed by surrounding structure, the combination comprising

(a) an axially elongated pin having edges to forcibly grip said structure at the boundary of the hole as the pin is inserted into the hole,

(b) the pin having first and second elongated grooves respectively sunk in opposite sides thereof, the full depth of each groove along a substantial portion of its length being greater than one-half the thickness of the section between said opposite sides of the pin, the grooves extending axially of the pin and configured to locally weaken the pin so that at least one flexure is formed by the pin to extend axially thereof between and adjacent the grooves and along the groove length,

(c) the flexure adapted to yieldably flex in response to insertion of the pin into the hole and progressive gripping of said structure by pin edges, thereby to reduce the cross sectional area of that groove in response to insertion of the pin into the hole.

4,223,971

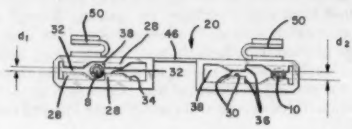
ELECTRICAL WIRING ASSEMBLY AND METHOD

Frank P. Dola, Port Richey, and Vincent Nicholas, Brooksville, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 871,866, Jan. 24, 1978, abandoned. This application Jan. 5, 1979, Ser. No. 1,127
Int. Cl.³ H01R *13/36*
U.S. Cl. 339—95 D **13 Claims**

1. An electrical connector for establishing an electrical termination to a relatively stiff copper wire, such as a wire having a diameter on the order of 0.064 in. (0.163 cm.), comprising a stamped and formed contact terminal having a wire termination slot defined by edges of resilient, longitudinally extending flange members, integral with said stamped and formed terminal, said resilient flange members being flexible only about an axis parallel to said edges, said edges gripping the wire so that an axial tensile force on the wire in one direction will tend to

flex said members so as to reduce the width of said slot and to increase resistance to the tensile force, a dielectric housing dimensioned to receive said contact terminal and an insertion member matable with said housing and movable longitudinally



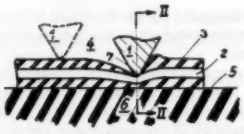
parallel to and in alignment with said slot for engaging said wire at a point spaced from said slot and moving said wire perpendicular to its length into said slot so that an electrical contact is established between said wire and said edges.

4,223,972

ELECTRICAL TERMINAL CLAMP FOR THE ESTABLISHMENT OF AN ELECTRICALLY CONDUCTING CONNECTION

Axel Olsen, Fortunvej 86, DK-2920 Charlottenlund, Denmark

Filed May 2, 1978, Ser. No. 902,223
Int. Cl.³ H01R *9/08*
U.S. Cl. 339—97 R **9 Claims**



1. An electrical terminal clamp which comprises

a housing having a cavity with a cylindrical wall and including at least one opening for allowing at least one insulated conductor to be inserted therethrough and into said cavity,

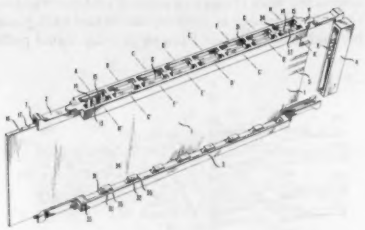
an electrically conductive contact member mounted for rotation within said cavity about a fixed axis, said contact member having a non-cutting scraping edge oriented so as to be generally transverse to a center line through each of said openings in said housing, said contact member being mounted so as to be movable from a first position at which an insulated conductor can be introduced through said at least one opening in said housing and be freely movable within said cavity, to a second position wherein an insulated conductor extending through said at least one opening into said cavity will be clamped between said scraping edge of said contact member and the wall of said cavity, said non-cutting scraping edge being rounded and having a radius of curvature less than 1 mm such that when an insulated conductor extends through said at least one opening and into said cavity and said contact member is moved from said first position to said second position, said scraping edge will break through and displace the insulation and then upon engaging the exposed conductor to establish contact therewith, will take the conductor along in its further movement along the wall of the cavity.

4,223,973

CIRCUIT BOARD KEYING ARRANGEMENT

Peter J. Tamburro, Hanover Township, Morris County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1979, Ser. No. 10,364
Int. Cl.³ H01R *13/64;* **H05R** *1/07*
U.S. Cl. 339—186 M **14 Claims**



1. For use with plug-in circuit boards (FIG. 1: 1) and circuit board receptacles (2, 3, 4), each receptacle having first and second guide rails (2, 3) for guiding the insertion of boards into the receptacles, a keying arrangement for preventing the insertion of boards into any but correct receptacles, CHARACTERIZED IN THAT

the first and second guide rails of each receptacle aggregately comprise at least first and second spring devices (13, 37) located at prescribed ones of a plurality of coded locations (A through H, A′ through H′) along the guide rails, each said device having a projection, and

each said board contains first and second indentations (FIG. 2: 17 and 22) located at predetermined ones of a plurality of coded locations on the board corresponding to the coded locations along the guide rails, the prescribed and predetermined locations of the spring devices and indentations being selected such that the devices and indentations do not interfere with the insertion of a correct board, and a board indentaion receives a projection to block the insertion of an incorrect board.

4,223,974

ENHANCED BONDING OF SILICON OXIDES AND SILVER BY INTERMEDIATE COATING OF METAL

Jon D. Masso, Whitinsville, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 2, 1978, Ser. No. 930,458
Int. Cl.³ G02B *5/28, 1/10, 3/00*
U.S. Cl. 350—1.7 **8 Claims**

1. In an interference filter having a silver layer and a SiO_x layer, where x has a value of 1 to 2 and the layers have been vapor deposited, the improvement comprising a, vapor-deposited, adhesion promoting metal layer selected from the group consisting of Ni, Cr and Inconel, intermediate said silver layer and said SiO_x layer.

4,223,975

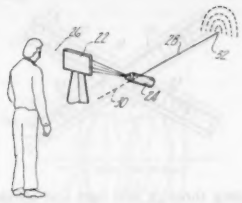
ABERRATION CORRECTION OF MAGNIFIED HOLOGRAPHIC IMAGES

Juris Upatnieks, Ann Arbor, Mich., assignor to Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 25, 1978, Ser. No. 945,686
Int. Cl.² G03H *1/12;* **G02B** *5/32;* **G03H** *1/22*
U.S. Cl. 350—3.68 **8 Claims**

1. In the method of forming an enlarged virtual image of an object by forming a first hologram of light reflected from a smaller model of the object and reconstructing the larger image from the first hologram by use of an illuminating light beam having a different geometry relative to the first hologram than the reference beam used during the formation of the first

hologram, the improvement comprising: correcting one point in said virtual image for aberrations resulting from the enlargement process by use of an illuminated holographic optical element as a light source during one stage of the method, the holographic optical element being formed by illuminating a second hologram of a point source, that point source bearing the same relation to the photographic plate employed to form



the second hologram as the desired corrected point on said virtual image reconstructed from said first hologram bears to an observer, with a reconstructing beam conjugate to the object beam; forming a third hologram of the reference source thereby reconstructed, said third hologram constituting said holographic optical element; and illuminating the third hologram with a light beam conjugate to the reference beam used in its formation.

4,223,976

OPTICAL FIBER JUNCTION DEVICE NOTABLY FOR TELECOMMUNICATIONS

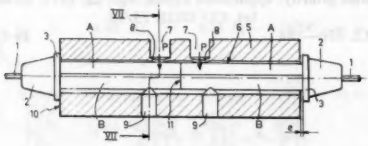
Fernand Zangiacomi, and Robert Gautheret, both of Besancon, France, assignors to France Ebauches, Besancon, France

Filed Oct. 30, 1978, Ser. No. 955,517

Claims priority, application France, Nov. 2, 1977, 77 32968; Dec. 19, 1977, 77 38174

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.21 **14 Claims**



1. A junction device for joining an optical fiber end to end with another optical fiber, said device comprising at least three uniform, parallel, cylindrical rods in tangential engagement with one another and defining an opening therebetween for the accommodation of one of said fibers; a sleeve having therein a bore within which said rods are accommodated; elastic means carried by said sleeve and exerting on one only of said rods a radially inward elastic force, said one of said rods transmitting said elastic force to the remainder of said rods to urge the latter into engagement with the surface of said bore; and guide means carried by said sleeve and extending into said bore for guiding and positioning said rods.

4,223,977

INTEGRATED OPTICAL DEMULTIPLEXING CIRCUIT

Michel Papuchon, and Claude Puech, both of Paris, France, assignors to Thomson-CSF, Paris, France

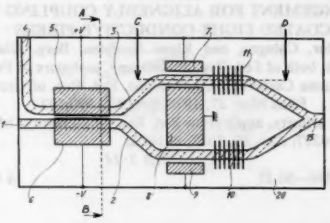
Filed Apr. 19, 1979, Ser. No. 31,603

Claims priority, application France, Apr. 25, 1978, 78 12183

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.11 **7 Claims**

1. Integrated optical demultiplexing circuit intended to receive an optical signal consisting of a plurality of optical waves of different wavelengths and to supply the various waves at separate outputs, comprising at least one basic cell comprising, integrated on the same plate, a directional coupler having one input path, two output paths for radiation in the forward direction and one output path for radiation in the reverse direction, and two guides extending the two forward output paths on each of which there is a reflecting network for radiation of a



definite wavelength, the two guides converging in order to form a single output guide, the optical paths between the forward output paths and the networks being adjusted so that, the coupler having divided the incident radiation between the two forward output paths, the two halves of the radiation reflected by the networks enter the coupler in phase-opposition and recombine in order to emerge in the reverse output path.

4,223,978

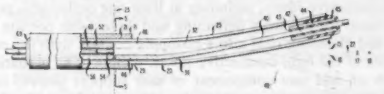
MECHANICAL OPTICAL FIBER SWITCHING DEVICE

Raymond B. Kummer, Norcross; Stephen C. Mettler, Decatur, and Calvin M. Miller, Lilburn, all of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 9, 1979, Ser. No. 19,098

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96.20 **13 Claims**



1. A device (**70**) of the type for coupling an end (**46**) of a first light-transmitting optical fiber (**40**) with an end of one of one or more second light-transmitting optical fibers (**50**) comprising:

an elongated sleeve (**20**) having a longitudinal axis (**22**), the sleeve also including a first (**26**) and second sleeve end (**28**) and an interior cross section (**24**) substantially larger than the cross section of any of the fibers, where the interior cross section is substantially longitudinally continuous and includes at least one corner (**30**) forming a fiber-aligning groove, where each one of the second fibers is associated with a corner and enters the sleeve from the second sleeve end, and where the first fiber enters the sleeve from the first sleeve end;

means for fixedly biasing (**60**) the end of each second fiber against its associated corner such that the end faces of the second fibers are substantially contained in a plane (**23**) transverse to the longitudinal axis of the sleeve, the transverse plane being at some predetermined location along the length of the sleeve; and

means for fixedly (**44**) securing a preselected portion (**42**) of the first fiber to the sleeve, where the preselected portion is some predetermined distance remote from the first fiber end, and where the first fiber end is adjacent the transverse plane such that the first fiber end can move with respect to the sleeve to axially align and substantially abut

with the end of any second fiber by abutting the associated corner, CHARACTERIZED BY;

the sleeve being capable of flexing with respect to the longitudinal axis; and

means for flexing (80) the sleeve to move the first fiber to the corner (30) containing the selected second fiber (50).

4,223,979
ARRANGEMENT FOR ALIGNEDLY COUPLING TWO COATED LIGHT-CONDUCTIVE FIBERS

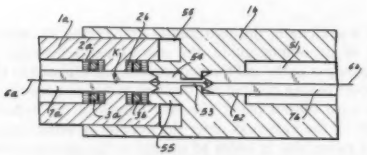
Hans Piter, Cologne, and Klaus Serapins, Berg. Gladbach-Refrath, both of Fed. Rep. of Germany, assignors to Felten & Guilleaume Carlswerk AG, Cologne, Fed. Rep. of Germany

Filed Mar. 27, 1978, Ser. No. 890,192

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1977, 2714327; Apr. 13, 1977, 2716222

Int. Cl.[2] G01B 5/14

U.S. Cl. 350—96.21 **4 Claims**



1. An arrangement for alignedly coupling two coated light-conductive fibers, comprising a support sleeve including two assemblable components, one of said components having a tubular region which bounds a receiving recess and another region axially adjacent said tubular region, the other of said components having at least an end region which is so configurated as to be fittingly received in said receiving recess upon assembly; three clamping rods; means for so mounting said clamping rods in said other component of said support sleeve as to extend parallel to each other and define with one another a passage for receiving respective stripped end portions of the light-conductive fibers, including at least one deflectable portion; means for inwardly deflecting said deflectable portion to press said clamping rods into a clamping contact with the end portions of the light-conductive fibers, including an actuating portion of said one component of said support sleeve; and means for affixing a respective one of said light-conductive fibers to said one component of said support sleeve, including three additional clamping rods which are so mounted in said other region of said one component of said support sleeve as to extend parallel to each other and define with one another an additional passage for partially receiving the respective light-conductive fiber, and means for inwardly pressing said additional clamping rods into a clamping engagement with that portion of the respective light-conductive fiber which is received between said additional clamping rods.

4,223,980
SAFETY REFLECTOR FOR FREIGHT CARS

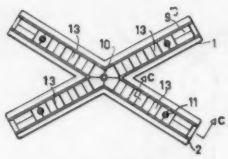
Bernard A. Shafar, 152 Vermont, LaSalle, Ont., Canada (N9J 1C9)

Filed Aug. 31, 1978, Ser. No. 938,709

Int. Cl.[2] G02B 5/12

U.S. Cl. 350—97 **2 Claims**

1. In combination, a railway freight car, a safety light-reflecting device attached to a side of said freight car and comprising a sign having a shape of an "X" in a horizontal position resembling a standard railway crossing warning sign, said sign comprising two elongate rectangular bars which cross each other at their centers, said bars having front, spaced, raised parallel tracks, reflecting material located in and filling the space between said front tracks, said reflecting material extending from a short distance away from the ends of the bars to the center of the intersection thereof, additional reflecting means between the front tracks at the outer ends of said bars beyond said reflecting material, and abutting the ends of the reflecting material, single rivet means at the intersecting ends of said reflecting material and affixing all four of the ends to said bars, hollow rivet means near the outer ends of each said



bars and extending through said bars and affixing outer end portions of said reflecting material to said bars, said hollow rivet means having bores extending completely therethrough from one end to the other for receiving fastener means extending therethrough for affixing said sign to the side of the freight car.

4,223,981
TELEPHOTO ZOOM LENS

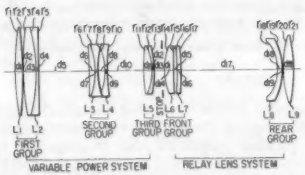
Norio Mizutani, Kawasaki, and Yoshinari Hamanishi, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 21, 1978, Ser. No. 898,879

Claims priority, application Japan, Apr. 22, 1977, 52-46635

Int. Cl.[2] G02B 15/18

U.S. Cl. 350—184 **19 Claims**



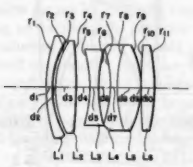
1. A telephoto zoom lens comprising a variable power system including a first group provided with a positive refracting power and capable of focusing by displacement along the optical axis, a second group provided with a negative refracting power and capable of continuously varying focal length by displacement along the optical axis and a third group provided with a positive refracting power and capable of maintaining the focal position constant regardless of the change in the focal length by displacement along the optical axis in cooperation with said second group, said system substantially constituting an afocal system to an infinite object; and a relay system including, in the order from the object side, a front group consisting of a positive lens component and a negative lens component which are separated, and a rear group consisting of a negative meniscus lens component convex to the image side and a positive lens component which are separated, the front and rear groups being separated by a substantial air space.

4,223,982

SEMI-WIDE ANGLE PHOTOGRAPHIC LENS HAVING SHORT OVERALL LENGTH

Takahiro Sugiyama, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 9, 1979, Ser. No. 2,137
Claims priority, application Japan, Jan. 23, 1978, 53-6031
Int. Cl.[2] G02B 9/60, 13/04
U.S. Cl. 350—216 3 Claims



1. A miniaturized semi-wide angle photographic lens system having six lens elements grouped into five components, comprising in order from the object side, a first component being a negative meniscus lens L_1 having convex surface directed toward the object, a second component being a positive lens L_2, a third component being a negative lens L_3, a fourth component is composed of negative and positive lenses L_4, L_5 cemented to each other, said fourth component having a positive focal length, and a fifth component is a positive lens L_6, the lens system satisfying the following conditions:

	OVERALL FOCAL LENGTH F = 100,		APERTURE RATIO 1 : 2.8		VIEW ANGLE ± 24°
L_1	$r_1 = 71.91$	$d_1 = 3.26$	$n_1 = 1.72825$	$\nu_1 = 28.5$	
	$r_2 = 42.26$	$d_2 = 1.59$			
L_2	$r_3 = 43.90$	$d_3 = 9.18$	$n_2 = 1.76200$	$\nu_2 = 40.2$	
	$r_4 = -248.88$	$d_4 = 6.76$			
L_3	$r_5 = -59.63$	$d_5 = 4.11$	$n_3 = 1.58913$	$\nu_3 = 61.1$	
	$r_6 = 71.64$	$d_6 = 5.44$			
L_4	$r_7 = -47.40$	$d_7 = 3.36$	$n_4 = 1.72825$	$\nu_4 = 28.5$	
L_5	$r_8 = 67.40$	$d_8 = 10.74$	$n_5 = 1.72000$	$\nu_5 = 50.2$	
	$r_9 = -45.18$	$d_9 = 0.41$			
L_6	$r_{10} = 399.80$	$d_{10} = 6.15$	$n_6 = 1.76200$	$\nu_6 = 40.2$	
	$r_{11} = -94.37$				

Backfocus = 95.967 = 0.96 F

$F_{1\text{-}2} = 75.148 = \frac{F}{1.33}$

$F_{1\text{-}2\text{-}3} = -519.534 = -\frac{F}{0.19}$

$\Sigma_d = 51.02 = 0.51$ F

Petzval's sum = 0.208

where:

r_1–r_{11} is the lens surface,

d_1–d_{10} is distance between two adjacent surfaces along the optical axis,

F is the focal length,

n_1–n_6 is the refractive index of the lens,

ν_1–ν_6 is Abbe number,

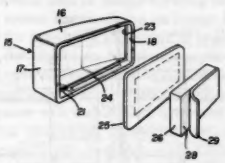
Σ_d is the overall lens length.

4,223,983

WIDE ANGLE MIRROR ATTACHMENT FOR VEHICLE SIDE VIEW MIRRORS

Stephen R. Bloom, Bloomfield Hills, Mich., assignor to Perfection Automotive Products Corporation, Livonia, Mich.

Filed Sep. 24, 1979, Ser. No. 78,263
Int. Cl.[3] G02B 5/10
U.S. Cl. 350—303 4 Claims



1. A wide angle mirror for attachment upon a vehicle side view mirror, comprising:

a thin wall, hollow, closed base and open top, plastic molded box formed of walls and a base which are integral to provide a unitary body, and a separate cover for application to the body to cover the open top thereof;

the free edges of the walls all being in a common plane, and elongated ledges formed upon the interior surfaces of the walls at a distance inwardly, i.e., towards the base, from said box edges and being parallel to said box edges;

said cover being formed of a thin plate normally fitted within said walls and engaged with said ledges;

and flanges formed upon the interior surfaces of said walls closely adjacent the plane of the free edges of the walls and spaced from their adjacent ledge portions a distance about equal to the plate thickness so that the plate is frictionally gripped between the ledges and flanges for thereby interlocking the plate within the box;

and said box walls being sufficiently resiliently flexible to flex the flanges apart so that the plate may be manually forced between opposing flanges and into contact with the ledges and thereafter the flange will close over the adjacent edge portion of the plate for thereby assembling the plate to the box body;

and an adhesive coating applied upon the exposed face of the plate, so that the plate may be applied against and adhesively fastened to the mirror surface of a side view mirror for thereby fastening the box thereto;

and the external surface of at least the base being reflective, and the base being curved so that said external face forms a wide angle reflective surface.

4,223,984

COLLAGEN SOFT CONTACT LENS

Teruo Miyata, Tokyo, Japan; Albert L. Rubin, Englewood, N.J.; Michael W. Dunn, New Rochelle, N.Y., and Kurt H. Stenzel, Englewood, N.J., assignors to Opticol Corporation, Stamford, Conn.

Continuation of Ser. No. 753,556, Dec. 22, 1976, abandoned.
This application Apr. 4, 1979, Ser. No. 26,945
Int. Cl.[2] G02C 7/04
U.S. Cl. 351—160 H 18 Claims

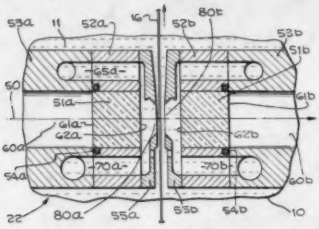
1. As an article of manufacture a soft contact lens consisting of a lens-shaped, subsequently cross-linked gel of solubilized, defatted, collagen, said gel comprising 1.0 to 30.0 wt. % collagen and the balance water.

4,223,985

METHOD AND APPARATUS FOR PROTECTING A FILM GATE AGAINST DIRT WHILE CHANGING FILMS

William D. Carter, Rancho Palos Verdes, and Martin S. Mueller, Torrance, both of Calif., assignors to Carter Equipment Co., Inc., Lawndale, Calif.

Filed Jul. 10, 1978, Ser. No. 923,002
Int. Cl.³ G03B *1/52*
U.S. Cl. 352—222 **8 Claims**



1. An apparatus used in connection with the passing of film through a film gate while immersed in or surrounded by a liquid wherein the gate has surfaces that need to be protected from accumulating dirt thereon when the film gate is removed from the liquid in which it is immersed during the process of changing from one reel or roll of film to the next, said apparatus comprising:

container means for housing said apparatus;

a first transparent vertically disposed member having an upper end, a lower end, an outer surface and an inner surface, having its outer surface embedded in one wall of said container means and having its inner surface parallel to and spaced from one surface of the film;

a second transparent vertically disposed member having an upper end, a lower end, an outer surface and an inner surface, having its inner surface parallel to the inner surface of said first transparent member, and spaced from the opposite surface of the film so that the film is equidistant from the inner surfaces of said first and second transparent members;

means for continuously supplying one stream of liquid to the upper end and inner surface of said first transparent member and another stream of liquid to the upper end and inner surface of said second transparent member so that a sheet of liquid continues to run down over each of said inner surfaces and to cover the same like a waterfall; and

guide frame means cooperatively associated with the inner surfaces of said transparent members and positioned outside of said waterfalls, for guiding a new film when inserted into the guide frames so that the new film may be inserted in a dry state despite the continuous operation of said waterfalls.

4,223,986

SURFACE ILLUMINATOR

Albert G. Choate, Honeoye Falls, N.Y., assignor to Automation Gages, Inc., Rochester, N.Y.

Filed Mar. 6, 1978, Ser. No. 883,478
Int. Cl.³ G03B *21/24*
U.S. Cl. 353—80 **12 Claims**

1. A surface illuminator, comprising

a housing having an opening in one end thereof,

a lamp mounted in said housing opposite said opening,

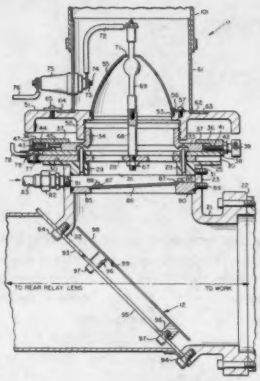
a paraboloidal reflector surrounding said lamp and having a large, open end facing said opening, and operative to reflect an annular beam of light from the lamp through said opening,

a light filter mounted in said housing transversely of said opening therein and operative to filter light of selected frequencies from the light beam passing through said opening, and

means mounting said lamp and said reflector for adjustment relative to one another in directions at right angles to the axes thereof,

said lamp comprising an elongate mercury arc lamp having its center located approximately on the focus of said reflector, and extending through an opening in the end of said reflector opposite the large, open end thereof,

means for supplying cooling air to said housing between said filter and said reflector,



said filter having thereon a plane surface facing said reflector and inclined to the axis thereof to reflect ultraviolet light along an axis inclined to the axis of said reflected beam, and

a mirror member mounted transversely of the axis of said reflector at the side of said filter remote from said lamp,

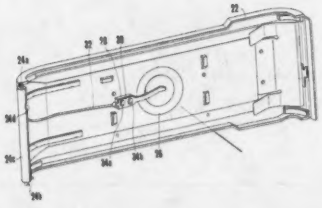
said member having thereon an annular surface disposed in a plane inclined to the axis of said reflector and registering with the annular light beam passing through said opening.

4,223,987

CAMERA HAVING A SOUND-MAKING ELEMENT

Masami Shimizu, Tokyo; Masanori Uchidoi, Yokohama; Nobuaki Date, and Hiroshi Aizawa, both of Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 19, 1978, Ser. No. 907,853
Claims priority, application Japan, May 30, 1977, 52-63064
Int. Cl.³ G03B *7/08, 17/18, 17/38*
U.S. Cl. 354—23 D **27 Claims**



1. A camera, comprising:

(a) a light sensing circuit for generating electric signals corresponding to an object brightness,

(b) data input means for producing electric signals corresponding to data set therein,

(c) output means for producing electric signals corresponding to a fully-open F-value of a photo-taking lens,

(d) an exposure value operating circuit responsive to said light sensing circuit and said data input means for producing exposure information corresponding to an object brightness,

(e) a constant voltage circuit for producing a reference voltage signal,

(f) low brightness signal detection means responsive to said exposure value operating circuit and said constant voltage circuit for producing an electric signal to indicate whether an exposure value is proper or not,

(g) logic means for detecting the condition of a power supply and a film winder to produce an electric control signal,

(h) pulse generation means for digitally controlling the camera and having an oscillator to generate clock pulses and a counter producing counting signals corresponding to signals from said oscillator,

(i) a sound-making control circuit responsive to said detection means, logic means and pulse generation means for generating a control signal indicating inadequate brightness and corresponding to the counting signals, and

(j) a sound-making element responsive to said control circuit for producing sound signals corresponding to the pulse waves of the control signal.

27. A camera for producing a sound signal during the operation of a self-timer, comprising:

(a) a pulse generator,

(b) counter means for counting the pulse signals from the pulse generator,

(c) release means for producing an operation signal of the release operation of a camera,

(d) self-timer operation means having selector means for switching into a self-timer mode and producing a self-timer operation termination signal after elapse of a predetermined time from the operation of the self-timer in accordance with the signal of the changeover means and the counter means,

(e) release actuating signal producing means for producing an electrical signal for actuating the release operation of a camera in accordance with the signal from either the self-timer operation means or the release means,

(f) a sound-making element for producing a sound signal,

(g) a sound-making element operating circuit for supplying an excitation signal to the sound-making element at least in accordance with the signal from the changeover means and the counting signal of the counter means,

(h) the release operation actuating signal producing means including logic means whose output signal is controlled at least in response to the self-timer operation means, and

(i) sound-volume selector means for changing the amount of energy applied to the sound-making element so as to enable selection between a loud and a softer sound.

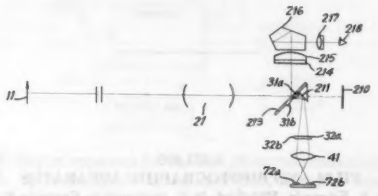
4,223,988

CAMERA HAVING A FOCUSING DEVICE

Masao Jyojiki, Saitama, and Kazuo Nakamura, Asaka, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 887,662, Mar. 17, 1978, Pat. No. 4,171,155. This application May 19, 1978, Ser. No. 907,771
Claims priority, application Japan, May 20, 1977, 52-57686
Int. Cl.[3] G03B *3/10*
U.S. Cl. 354—25 **13 Claims**

1. In a single lens reflex camera, objective means having a first optical axis for focusing an image of an object which is to be photographed in a film plane which is normal to said first optical axis, view finder means, and semitransparent reflector means extending across said first optical axis between said objective means and film plane for reflecting an image of the object to said view finder means while permitting an image also to be focused by said objective means at said film plane, light-deflecting means situated behind said reflector means between the latter and said film plane for deflecting light traveling through said semitransparent reflector means from said first optical axis to a path extending along a second optical axis which branches from said first optical axis, and a device for determining when said objective means has properly focused an image at said film plane, said device comprising an optical system situated at least in part along said second optical axis and including along said second optical axis an image plane normal to said second optical axis and having at said second optical axis a location which is optically equivalent to the location of said film plane along said first optical axis, said optical system including in advance of said image plane at least at one of said optical axes an image-forming means including a first refracting means for receiving an image from said objective means and for providing therefrom at least a pair of identical images of the object to be photographed at said image plane, and said optical system having beyond said image plane along said second optical axis a detecting plane also normal to said second optical axis and at said detecting plane at least a pair of identical elongated photosensitive detecting means which have respectively optically equivalent positions with respect to said second optical axis, each of said detecting means providing an output which varies as an image is moved longitudinally along each detecting means, said optical system including an imagetransmitting means situated at least in part at



said image plane including a second refracting means situated at said image plane for receiving each of said identical images of the object to be photographed from said first refracting means and for participating in the transmission thereof to said detecting plane in a manner according to which said identical images of the object to be photographed simultaneously move equally in opposite directions along said pair of detecting means in response to adjustment of said objective means to focus an image at said film plane, said pair of detecting means providing equal outputs when the images at said pair of detecting means are respectively situated at identical positions with respect thereto and different outputs when said images at said pair of detecting means are respectively situated at different positions with respect thereto, and the image transmitted by said objective means to said film plane being properly focused at said film plane when the pair of images at said pair of detecting means are respectively at the same positions with respect thereto, and indicating means operatively connected with said pair of elongated detecting means for indicating that when the identical transmitted to said pair of elongated detecting means are respectively situated at identical positions therealong, this indicating when said objective means has been set to focus an image properly at said film plane.

4,223,989

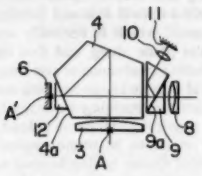
FOCUSING OPTICAL SYSTEM FOR SINGLE-LENS REFLEX CAMERAS

Yoshisada Hayamizu, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1978, Ser. No. 972,061
Claims priority, application Japan, Dec. 29, 1977, 52-157919
Int. Cl.[3] G03B *13/08*
U.S. Cl. 354—59 **1 Claim**

1. A focusing optical system for single-lens reflex cameras comprising a finder optical system arranged to observe a light from a photographing lens by means of an eyepiece after letting the light pass through a penta-prism, a semi-transparent

mirror arranged between said penta-prism and said eyepiece in said finder optical system, a reflecting mirror arranged to further reflect the light reflected by said semi-transparent mirror and to return said light in inverse direction, a detector



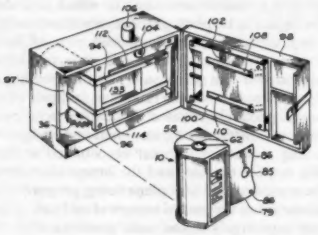
arranged at a position near an external surface of said penta-prism, and a lens arranged between said semi-transparent mirror and said reflecting mirror for the purpose of forming an image of said light reflected by said reflecting mirror onto said detector.

4,223,990

FILM AND PHOTOGRAPHIC APPARATUS

Evan A. Edwards, Pittsford, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 14, 1979, Ser. No. 20,283
Int. Cl.³ G03B *1/22, 17/42, 19/04*
U.S. Cl. 354—204 **7 Claims**



1. In a camera having a metering mechanism and a film transport mechanism for advancing a filmstrip having (1) a leader, (2) an image portion, (3) perforations of a given characteristic spaced at predetermined metering intervals along the image portion, and (4) perforations of another characteristic spaced along the leader; the improvement wherein said metering mechanism comprises:

means for sensing the presence of a film perforation at a predetermined position in the camera and for distinguishing between perforations of said given characteristic and said other characteristic; and

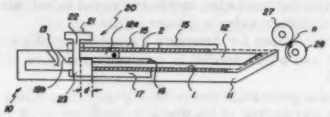
means for releasably disabling the film transport mechanism upon detection by said sensing means of a film perforation of only said given characteristic at said predetermined position, whereby perforations in the leader will be advanced past said predetermined position and perforations in the image portion will be stopped at said predetermined position.

4,223,991

IMAGE-TRANSFER PROCESSOR

Barry S. Brenner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 6, 1979, Ser. No. 27,697
Int. Cl.³ G03D *3/10*
U.S. Cl. 354—302 **7 Claims**



1. Apparatus for effecting image-transfer processing with donor and receiver sheets, said apparatus comprising:

(a) tray means for containing a quantity of processing solution and for supporting such a donor sheet at a first position within such solution and in transverse alignment on a first feed path;

(b) guide means for supporting a receiver sheet on a second feed path which is spaced from, and in transverse alignment with, said first feed path;

(c) squeegee means, located at a predetermined downstream position with respect to said first and second feed paths, for receiving sheets fed along said first and second paths and for pressing such sheets into image-transfer contact; and

(d) moving means for longitudinally aligning supported donor and receiver sheets and for feeding such sheets into said pressing means in longitudinal registry, said moving means comprising a pusher member, mounted for movement longitudinally along said paths toward and away from said pressing means, and having first and second surfaces for contacting respectively the trailing edges of supported donor and receiver sheets;

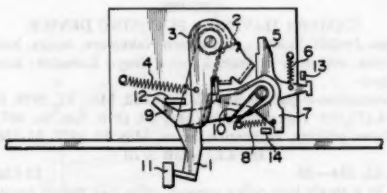
whereby said sheets are pressed into image-transfer contact in both transverse and longitudinal registry.

4,223,992

RELEASE DEVICE IN A CAMERA EQUIPPED WITH SELF-COCKING MECHANISM

Susumu Takeda; Kiyoaki Hazama, and Nobuo Ichitsuka, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co. Ltd., Tokyo, Japan

Filed Apr. 20, 1978, Ser. No. 898,077
Claims priority, application Japan, Apr. 20, 1977, 52-44518
Int. Cl.² G03B *9/08, 17/42*
U.S. Cl. 354—266 **2 Claims**



1. A release device of a camera which comprises a controlling member **1** operable to actuatate a release-motion actuating member **11** which in turn is operable to actuate shutter blades or blinds to effect exposure, a charging member **3** operatively connected to a working member **12** reciprocally movable between a first position and a second position in response to film winding operation and which is locked in its charged position by a charge-holding member **5**, means normally biasing said charging member **3** in a direction opposing movement

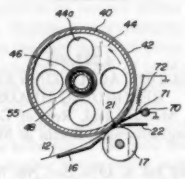
by said working member **12**, said controlling member **1** being operatively connected to said charging member **3** and operable to allow movement of said actuating member **11** in response to movement of said charging member **3** by said biasing means, said controlling member **1** being locked by a first stopping member **7** which is moved in response to movement of a disengagement member **14** caused by the shutter release operation to unlock said locked controlling member **1**, a charge-releasing member **13** actuated upon completion of exposure and adapted to bring said charge holding member **5** out of engagement with said charging member **3**, a second stopping member **9** for locking said controlling member **1**, said second stopping member **9** being operatively connected to said working member **12** to unlock said controlling member **1** when said working member **12** is in its first position and lock said controlling member **1** when said working member **12** is in positions substantially other than said first position, whereby after completion of the shutter release operation and while said first stopping member **7** is held displaced from its position locking said controlling member **1** by said disengagement member **14**, and after charging of said charging member **3**, and when said working member **12** is returned to its first position, the shutter releasing operation can be conducted.

4,223,993

ELECTROPHOTOGRAPHIC APPARATUS

Hiroshi Tsuda, Mitaka, and Kiyoshi Miyashita, Hachioji, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 22, 1979, Ser. No. 51,519
Claims priority, application Japan, Jun. 27, 1978, 53-76940
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—3 R **11 Claims**



1. An electrophotographic apparatus comprising

an electrostatic charge retentive drum arranged rotatably about its axis and including a drum-shaped substrate made of electrically conductive material and a charge retentive layer applied on the drum substrate;

means for transferring a toner image formed on the charge retentive layer onto a record carrier, while the record carrier is fed with being made into intimately contact with the charge retentive drum surface;

at least one peeling claw for peeling the record carrier off the drum after the toner image has been transferred onto the record carrier and made of electrically conductive material, said peeling claw being urged against one side edge portion of the drum substrate of the charge retentive drum; and

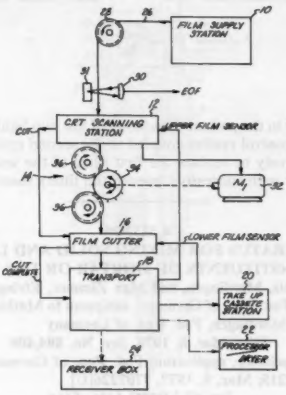
means for connecting the peeling claw to the earth potential so as to contact conductively the drum substrate to the earth potential via the peeling claw.

4,223,994

TYPESETTING TRANSPORT MECHANISM

Arthur J. Stanton, Satellite Beach; Meredith T. Raney, Melbourne, and Ralph L. Parker, Melbourne Beach, all of Fla., assignors to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 851,882, Nov. 16, 1977, abandoned, which is a continuation of Ser. No. 636,302, Nov. 28, 1975, abandoned. This application Oct. 3, 1978, Ser. No. 948,314
Int. Cl.³ G03B *29/00*
U.S. Cl. 355—28 **5 Claims**



1. Transport apparatus for use with photocomposition means which, upon receipt of an indication, controllably exposes individual strips of film, said apparatus comprising:

a first film buffer adapted to receive each of said strips from said photocomposition means as it is produced and for retaining said strip until the entire said strip is produced by said photocomposition means,

film advance means for grasping the leading portion of each of said strips as it is fed to said first film buffer, for holding said leading portion substantially stationary until the entire said strip is produced by said photocomposition means, and for transporting each of said strips from said first film buffer to a second film buffer upon the completion of each of said strips by said photocomposition means,

a second film buffer for receiving each of said strips from said first film buffer and controllably feeding said strips into a first output means, and

first output means for receiving said strips from said second film buffer,

wherein said film advance means further includes sensor means for sensing when said leading portion is being held by said film advance means, and for then indicating to said photocomposition means that the controlled exposure of said strip may begin.

4,223,995

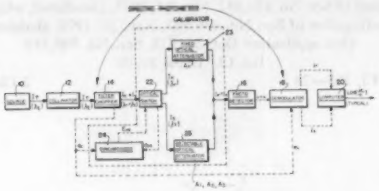
CALIBRATION SYSTEM FOR SPECTROPHOTOMETERS

Taylor C. Fletcher, 1534 Sunny Crest Dr., Fullerton, Calif. 92635

Filed Aug. 22, 1978, Ser. No. 935,868
Int. Cl.³ G01J *3/48, 3/42*
U.S. Cl. 356—418 **14 Claims**

1. A calibration system for a spectrophotometer of the type which uses at least first and second light beams which pass through a common sample cell, said calibration system comprising: optical attenuation means comprising a first optical attenuator including a neutral density filter of a known attenuation value and a second optical attenuation including a plurality of neutral density filters each of a different known attenua-

tion value; and control means including a first control system coupled to the first and second attenuators selectively to place the filter of the first attenuator in the path of the first of the two light beams and a first one of the filters of the second optical



attenuator in the path of the second of the two light beams, and a second control system coupled to the second optical attenuator selectively to replace the first filter of the second optical attenuator with successive ones of the filters thereof.

4,223,996

APPARATUS FOR MIXING SOLID AND LIQUID CONSTITUENTS OF MORTAR OR THE LIKE

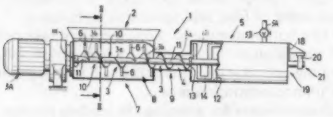
Paul Mathis, Merdingen, and Max Zimmer, Efringen-Kirchen, both of Fed. Rep. of Germany, assignors to Mathis Fertigputz GmbH, Merdingen, Fed. Rep. of Germany

Filed Mar. 8, 1978, Ser. No. 884,409

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1977, 2710215; Mar. 9, 1977, 7707226[U]

Int. Cl.³ B28C *1/16, 5/14*

U.S. Cl. 366—27 **32 Claims**



1. Apparatus for mixing flowable solid and liquid constituents, such as cement and water, comprising a housing including a first section having inlet means for admission of the solid constituent, and intermediate section communicating with said first section, and a mixing chamber communicating with said intermediate section; means for admitting the liquid constituent into the interior of said mixing chamber; and means for conveying the solid constituent from said first section into said mixing chamber via said intermediate section, including a rotary feed screw journalled in said housing and extending through the interior of said sections, and feed screw comprising a helical thread having at least two discrete portions which are separated by a gap in said first section.

4,223,997

PORTABLE CEMENT MIXER

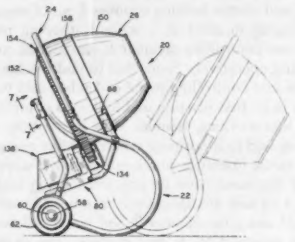
Jon A. Violet, Fredericktown, Ohio, and Hans Hauser, Bradenton, Fla., assignors to The J. B. Foote Foundry Co., Fredericktown, Ohio

Filed Feb. 16, 1979, Ser. No. 12,586

Int. Cl.² B28C *5/20*

U.S. Cl. 366—47 **6 Claims**

1. A mixer comprising a base frame having two spaced frame members with generally U-shaped portions positioned to engage a supporting surface, said base frame also having wheels and means maintaining said frame members in a spaced relationship, a mixing drum rotatably carried by said base frame and having an axle and a charge and discharge opening facing away from said wheels, whereby the mixer can be tilted on said U-shaped frame portions to discharge contents from said drum, said mixing drum having a circular cross section of varying diameter throughout at least most of its length, said drum having structurally-integral molded gear teeth forming a ring gear at a circular portion of said drum intermediate said opening and said axle, a motor mounted on said base frame, said motor having a drive shaft and a single drive gear mounted on said drive shaft, means mounting said drum on said base frame for rotation about an axis at an angle to the horizontal, said drive shaft being positioned to rotate on an axis parallel to said



drum axis for all positions of said drum, with said drive gear being directly engagable with said ring gear, said drum mounting means comprising bearing means on said base frame rotatably carrying said axle, rollers on said base frame rotatably mounted thereon and engagable with said drum at a location spaced from said axle toward said drum opening, and quick release means engagable with said drum axle to prevent removal of said axle from said bearing means when said quick release means is engaged with said axle.

4,223,998

PIEZO-ELECTRIC ACTUATING ELEMENT FOR RECORDING HEADS

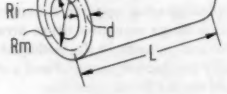
Joachim Heinzl, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 6, 1976, Ser. No. 702,571

Claims priority, application Fed. Rep. of Germany, Aug. 25, 1975, 2537767

Int. Cl.³ H01V *7/00;* **B41J** *3/04*

U.S. Cl. 400—126 **1 Claim**



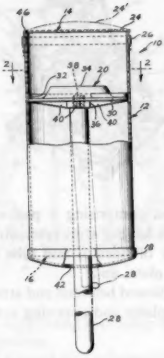
1. A piezo-electric actuating element for recording heads, particularly for use in mosaic-type recording equipment, in which a recording fluid contained in a compression chamber surrounded by a cylindrical actuating element, is forced out in droplets by piezo-electric constriction of the actuating element, comprising a generally cylindrical tubular body of piezo-electric material, having an internal radius of Ri and external radius of Ra, is so proportioned that the quotient derived from the wall thickness ($d = Ra - Ri$) and the arithmetic mean of the internal and external diameters ($Ra + Ri$) matches the Poisson number (μ) of the piezo-electric employed.

4,223,999

APPLICATOR FOR APPLYING A COATING OF STIPPLED PLASTER

Ralph W. Wells, 610 S. Beckey Station Rd., Louisville, Ky. 40223

Filed Dec. 18, 1978, Ser. No. 970,657
Int. Cl.³ B05C 17/10
U.S. Cl. 401—176 **18 Claims**



1. A stipple applicator for applying a stippled coating of paste material to a surface comprising a generally tubular member defining a chamber adapted to receive therein paste material, said tubular member having an end portion defining an opening, a piston disposed within said chamber, means for moving said piston in a direction toward said opening to urge paste material adapted to be housed within said chamber toward said opening, flexible screen spanning said opening and being responsive to the movement of paste material through said opening for restricting the flow of paste material from said opening and through said flexible screen for deposit upon a surface and being slightly bowed convexly outwardly under the influence of the piston, said flexible screen being further operative under the influence of the paste material compressed thereagainst by a double compression action of said piston moving towards said flexible screen while the latter is deflected toward said opening and toward a less bowed condition when the flexible screen is forcefully urged against a surface upon which a stippled coating is adapted to be applied.

4,224,000

TUBULAR DRAFTING PEN WITH IMPROVED WRITING POINT ASSEMBLY

Bernhard Endres, Winkelhaid, Fed. Rep. of Germany, assignor to J. S. Staedtler, Nuremberg, Fed. Rep. of Germany

Filed Dec. 15, 1978, Ser. No. 969,924
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1977, 2757554
Int. Cl.³ A43K 5/00
U.S. Cl. 401—198 **10 Claims**

1. Writing point assembly for a tubular drafting pen comprising:

(a) an elongated tubular shell having a longitudinal axis;

(b) a tubular, capillary nib projecting in the axial direction of said shell from one terminal portion of said shell in the axial direction thereof, the other terminal portion of said shell being cup-shaped;

(c) a sliding weight guided in said shell and bounding an ink storage space in the axial direction in said other terminal portion,

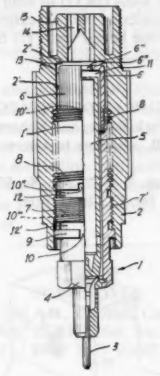
(1) said weight and an inner wall of said shell bounding a section of an ink feeding channel connecting said ink storage space with said nib;

(d) a tubular holder laterally enclosing at least an axially extending part of said shell;

(e) fastening means on a first section of the outer axial face of said shell for fastening the shell in said tubular holder;

(f) a collar on said outer axially extending face of said shell spaced intermediate said fastening means and said nib for centering said shell by engagement with said holder,

(1) said collar defining a portion of an air channel axially by-passing said collar and said air channel communicating with the ambient atmosphere,



(g) a second axially extending section of said outer face intermediate said fastening means and said other terminal portion defining a further substantial portion of said air channel, said further portion communicating with said ink storage space over the cap-shaped other terminal portion of said shell; and

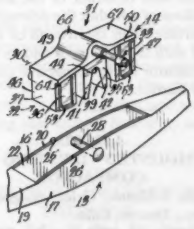
(h) two non-capillary annular grooves one located between said collar and said fastening means and the other located between said fastening means and said further substantial portion of said air channel.

4,224,001

WINDSHIELD WIPER CONNECTING PIN ADAPTOR

John J. Arndt, Chesterton; Gary W. Roadarmel, Michigan City, and Francis D. Wirick, Portage, all of Ind., assignors to The Anderson Company of Indiana, Gary, Ind.

Filed May 24, 1979, Ser. No. 42,049
Int. Cl.² F16C 11/06; F16D 1/12
U.S. Cl. 403—163 **10 Claims**



1. In a wiper assembly **(10)** with a yoke **(13)** having a pair of spaced lateral walls **(16,17)** defining an opening **(20)** therebetween and a cross rivet **(28)** extending between the lateral walls **(16,17)** within the opening **(20)** and providing a center mounted pin connection for a wiper arm **(11)**, a connecting pin adaptor **(14)** for converting to a side mounted pin connection

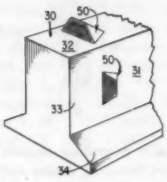
comprising a body (30) having a top portion (31) and a mounting portion (32), and a connecting pin (33) extending laterally outward from said top portion (31) and being adapted for connection to a wiper arm (11), said mounting portion (32) having a slot (39) adapted to receive the cross rivet (28) therein and a plurality of deflectable claws (36) depending from said top portion (31) each having portions (53) adapted to engage the lateral walls (16,17), whereby the mounting portion (32) of the connecting adaptor (14) is inserted into the opening (20) over the cross rivet (28) with the claws (36) being deflected laterally inward until the claw portions (53) deflect outwardly to engage the lateral walls (16,17) to hold the adaptor (14) in position with the connecting pin (33) extending laterally from the yoke (13) above one lateral wall (17) thereof.

4,224,002

HIGHWAY DELINEATOR

Sidney A. Heenan, Park Ridge, and Robert M. Flanagan, Lincolnshire, both of Ill., assignors to Amerace Corporation, New York, N.Y.

Filed Aug. 4, 1978, Ser. No. 931,012
Int. Cl.[2] E01F *9/00*
U.S. Cl. 404—9 **22 Claims**



1. A reflective roadway delineator for reflecting incident light directed thereon by an incoming vehicle back to the vehicle, the delineator being capable of being mounted upon either a roadway barrier having planar longitudinally extending surfaces thereon or in the generally U-shaped trough of a longitudinally extending highway guard rail, the delineator comprising: a base member including a pair of side walls, a bottom wall and a top wall, said bottom wall comprising a first mounting surface for securing the delineator to an associated barrier or guard rail; said side walls comprising a pair of second mounting surfaces for securing said delineator in the trough of an associated guard rail; one set of intersecting edges of said walls defining a mounting area; a reflex reflector fixedly carried by said base member on said mounting area at predetermined angles relative to said mounting surfaces; said reflex reflector, said base member and said mounting surfaces being configurated and arranged such that said reflex reflector will be positioned at substantially the same operating angle relative to the longitudinal axis of either of the associated barrier or guard rail, regardless of whether the delineator is affixed to the barrier planar surface or in the trough of the guard rail; and means associated with at least one of said mounting surfaces for securing said delineator to the respective associated guard rail or the associated barrier.

4,224,003

BACKHOE MOUNTED VIBRATING PLATE SOIL COMPACTOR

Paul T. St. Louis, Littleton, Colo., assignor to Construction Technology, Inc., Denver, Colo.

Filed Dec. 20, 1978, Ser. No. 971,383
Int. Cl.[2] E01C *19/30*
U.S. Cl. 404—133 **8 Claims**

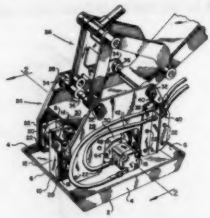
1. A vibrating plate compactor adapted for connection to and use with a loading boom comprising:

a base plate for engaging a work surface,

a rectangular structural steel tube having one of a first pair of opposite sides bonded to said base plate, and having opposing centrally positioned apertures in each of a second pair of opposite sides,

bearing means carried in said apertures,

a shaft supported by said bearing means including an eccentric weight positioned within said tube,



a mounting frame comprising a pair of parallel inverted U-shaped plates having arms symmetrically spaced about the second pair of sides of said tube and equally spaced from said base plate, and

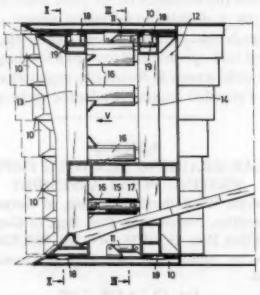
spring means positioned between and attached to the arms of said U-shaped plates and opposing surfaces of said structural steel tube.

4,224,004

KNIFE SHIELD

Herbert Heitkamp, Werne, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 933,536
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736398
Int. Cl.[3] E01G *3/00*; E21D *9/06*
U.S. Cl. 405—145 **14 Claims**



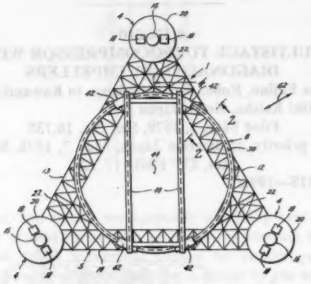
1. A knife shield comprising: a plurality of elongate knives which are arranged side-by-side so as to define a generally cylindrical shield surrounding a support frame, each of said knives being mounted for movement in its longitudinal direction upon a respective elongate guide member, said guide members being carried on hydraulic bracing rams mounted on said support frame, said bracing rams acting on said guide members to move the knives associated therewith radially with respect to the longitudinal axis of said shield, and means for hydraulically coupling the bracing rams acting on the guide means of diametrically opposed knives so as to move said diametrically opposed knives conjointly while maintaining a parallel relationship therebetween.

4,224,005

TRUSS RIG

Edward D. Dysarz, Houston, Tex., assignor to James G. Brown & Associates, Inc., Houston, Tex.

Filed Dec. 10, 1975, Ser. No. 639,436
Int. Cl.[2] E02B *17/08*
U.S. Cl. 405—196 **38 Claims**



1. A rig for use in supporting and using equipment above the ocean bottom, comprising:

a body, said body formed by a substantially completely open network of truss-like members, said members forming open inner and outer vertical and horizontal peripheries of said body which permit wind and light to pass through said body;

leg means connected to said body for supporting said body above such ocean bottom while such equipment is in use;

platform means mounted on said body for supporting at least some of such equipment;

said leg means including elevation means for elevating said body above such ocean bottom and connection means for connecting said elevation means to said body;

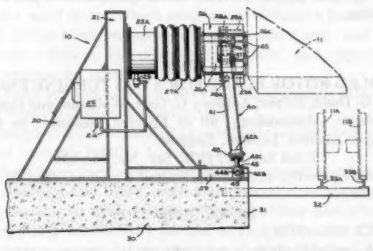
said body having structural negative bouyancy; and said leg means includes only three legs.

4,224,006

HOPPER CAR DISCHARGE APPARATUS

George D. Dumbaugh, Louisville, and Paul A. Wilson, Saint Matthews, both of Ky., assignors to Vibranetics, Inc., Louisville, Ky.

Filed Sep. 28, 1978, Ser. No. 946,576
Int. Cl.[3] B65G *67/24*
U.S. Cl. 414—375 **7 Claims**



1. Improved apparatus for accelerating the emptying of railroad hopper cars and the like, comprising:

(a) rigid frame means fixedly mountable through base means to a pair of horizontally-spaced-apart rails upon which the wheels of a railway hopper car can be movably supported,

(b) said frame means including an upright section from which there generally horizontally extends toward the rails hollow spool means that can be fluid-connected to a source of pressurized fluid and also can be vented of said pressurized fluid through valve means;

(c) excitor means connected to said spool means through inflatable yieldably resilient sleeve means that perform dual functions of moving said excitor means generally horizontally with respect to said frame means into and out of contact with a side of the hopper car and also vibration isolating said excitor means from said frame means; and

(d) stabilizer means connected between said excitor means and said frame means and having the capacity for multi-direction movement,

(e) said frame means including a second section which is vertically spaced apart from said spool means and extends generally horizontally from said upright section towards said rails, and

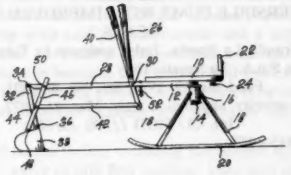
(f) said stabilizer means comprising linkage means including a rigid link connected at each of its opposite ends between said second section of said frame means and said excitor means through a vibration isolating member having a rigid central portion and hollow end portion at opposite ends thereof, each of which is lined with a yieldably resilient material and has a central bore offset by a right angle from that of the other.

4,224,007

TOY SHOVEL

Gerard Chabot, 7 - 2nd Ave., Cadillac, Canada (J0Y 1C0)

Filed Sep. 25, 1978, Ser. No. 945,608
Int. Cl.[3] E02F *3/75*; A63H *17/12*
U.S. Cl. 414—694 **3 Claims**



1. A toy shovel comprising:

(a) a seat;

(b) a first arm pivotally mounted on said seat at one end and extending forwardly therefrom;

(c) a second substantially vertical arm pivotally mounted at its upper end to said first arm;

(d) a shovel mounted for pivotal movement at the lower end of said second arm;

(e) a first handle pivotally mounted on said seat and secured to said first arm for controlling the depth of the cut made by said shovel;

(f) a second handle pivotally mounted on said seat; and

(g) linkages interconnecting said second handle and said shovel for controlling the pivotal movement of said shovel, said linkages including a first rigid link pivotally joining said shovel to said first arm, and a second rigid link pivotally joining said second handle to said first link.

4,224,008

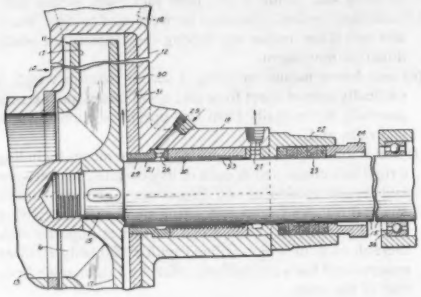
VOLUTE SLURRY PUMP AND THROTTLE BUSHING THEREFOR

Walter D. Haentjens, R.D. #1, Box 121, Sugarloaf, Pa. 18249

Filed Sep. 5, 1978, Ser. No. 939,448
Int. Cl.[3] F01D *25/16*
U.S. Cl. 415—112 **11 Claims**

1. In a single volute pump of a type used for pumping slurries and having a casing having a generally spiral interior wall, a central inlet into said casing, a cantilever shaft coaxial with said inlet, an impeller within said casing on the overhanging end of

said shaft, bearing support means spaced a substantial distance from said impeller on the opposite side of said casing from said inlet, said shaft being deflectable by the weight of said shaft outwardly of said bearing support means to the impeller end thereof and the weight of said impeller on the end of said shaft and the unequal radial forces on said impeller under load conditions other than capacity load conditions, sealing means



mounted within said casing inboard of said bearing support means, and means reducing the pressure on said sealing means comprising throttle bushing means having an inner wall machined to match the deflection of said shaft and to clear said shaft in all operating conditions of said pump and attaining an increasing throttling effect on said shaft as deflected as said throttle bushing means approaches said sealing means.

4,224,009

SUBMERSIBLE PUMP WITH IMPROVED SEALING MEANS

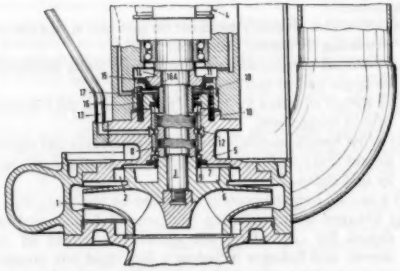
Attilio Grandi, La Spezia, Italy, assignor to Termomeccanica Italiana S.p.A., La Spezia, Italy

Filed Mar. 9, 1978, Ser. No. 884,801

Claims priority, application Italy, Mar. 21, 1977, 12520 A/77

Int. Cl.³ F01D *11/00, 15/08*

U.S. Cl. 415—168 **1 Claim**



1. In a vertical submersible pump, a hydraulic motor, a driven shaft driven by said motor, an impeller on said driven shaft, a first seal sealing circumferentially of said driven shaft to prevent leakage of hydraulic fluid along said shaft, a second seal to prevent leakage along said shaft of a fluid pumped by said impeller, means defining a collecting chamber circumferentially of said shaft intermediate said first seal and said second seal, means to prevent hydraulic fluid leakage into the pump and to prevent leakage of the liquid being pumped into the hydraulic motor comprising two labyrinth pumps about said driven shaft on opposite sides of said collecting chamber pumping hydraulic fluid leakage and the pumped fluid leakage respectively to said collecting chamber intermediate therebetween, said two labyrinth pumps comprising a first labyrinth pump continuously applying during rotation of said shaft a suction to said first seal to pump under pressure into said collecting chamber hydraulic fluid leakage past said first seal into said collecting chamber and a second labyrinth pump continuously applying a suction during rotation of said shaft to said second seal to pump under pressure into said collecting chamber leakage of the liquid being pumped past said second seal, and means to feed the leakage received in said collecting chamber externally of said pump.

4,224,010

MULTISTAGE TURBOCOMPRESSOR WITH DIAGONAL-FLOW IMPELLERS

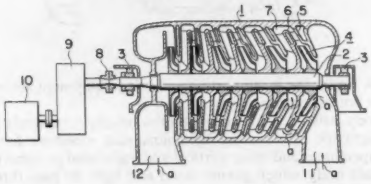
Yoshikazu Fujino, Kobe, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan

Filed Mar. 2, 1979, Ser. No. 16,735

Claims priority, application Japan, Mar. 7, 1978, 53-26119

Int. Cl.³ F04D *17/12*

U.S. Cl. 415—199.2 **8 Claims**



1. In a multistage turbocompressor which has a casing having suction and discharge ends, a rotating shaft passing through the casing, and a plurality of impellers fixedly mounted on the shaft in successive tandem arrangement, and which operates to draw a gas in through the suction end, to compress the gas, and to discharge the gas out through the discharge end, the improvement wherein at least some of the impellers are diagonal-flow impellers with exit flow angles less than 90 degrees, and, when the impellers are considered to be divided in a plurality of successively tandem groups each having at least one impeller, the exit flow angle of an impeller of any group nearer the suction end is made less than the exit flow angle of an impeller of a group more remote from the suction end than the first named group thereby to cause the specific speed of each impeller to be of optimal value, the exit flow angle of an impeller being the angle between the velocity component along a streamline within an imaginary meridional plane extending from the flow entrance to the flow exit of that impeller and passing through the axis of rotation thereof and the axis of rotation.

4,224,011

COOLED ROTOR BLADE FOR A GAS TURBINE ENGINE

Alec G. Dodd, Belper; Anthony G. Gale, Wollaton, and Derek A. Roberts, Almondsbury, all of England, assignors to Rolls-Royce Limited, London, England

Filed Sep. 27, 1978, Ser. No. 946,136

Claims priority, application United Kingdom, Oct. 8, 1977, 41960/77

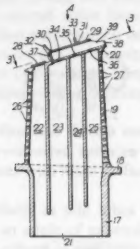
Int. Cl.³ F01D *5/18*

U.S. Cl. 416—97 R **7 Claims**

1. A cooled blade for a rotor of a gas turbine engine comprising:

an aerofoil, a tip portion and a root portion integrally formed as a whole, cooling fluid passages extending longitudinally through said aerofoil with at least one of said passages being open at one end to said tip portion, a chordwise extending tube having a closed end and an open end and at least one aperture in its wall communicating with the open end of said at least one of said cooling fluid passages, said

tube receiving spent cooling fluid from said passages through said aperture and discharging the same through the cooling tube's open end to rejoin gas flow of the



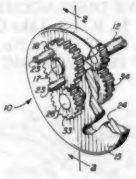
engine, and means mechanically attaching said tube directly to said tip portion to positively restrain said tube against radial movement caused by centrifugal forces regardless of temperatures encountered by the blade.

4,224,012

TIMING MECHANISM FOR WIND MOTORS

Herbert O. White, 4242 E. Wilshire, Phoenix, Ariz. 85008

Filed Sep. 28, 1978, Ser. No. 946,712
Int. Cl.³ F03D *3/06*
U.S. Cl. 416—117 **8 Claims**



1. An improved timing mechanism especially adapted for use with a wind motor, which wind motor includes a frame and a wind driven blade movable relative to said frame, and for selectively adjusting the offset of said blade, said improved timing mechanism comprising:

(a) a blade support axle shaft having a blade support axle axis of rotation carried by said frame;

(b) a support member carried by said blade support axle shaft and rotatable relative to said frame;

(c) blade support means carried by said support member for rotation of said blade about a blade axis of rotation, said blade support axis of rotation and said blade axis of rotation being substantially parallel to each other;

(d) timing means for maintaining a predetermined ratio between the speed of rotation of said wind driven blade and the speed of rotation of said support member;

(e) adjustment means, including socket means formed on said support member for receiving said blade axle shaft at selectively variable locations relative to said axis of rotation of the blade support shaft; and

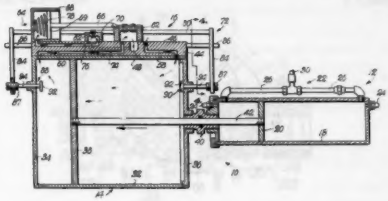
(f) means for securing said blade axle shaft at any one of said variable locations.

4,224,013

AUTOMOBILE VACUUM SYSTEM FOR INFLATING TIRES

Arthur Davis, Sr., 3817 Duplessis Park, New Orleans, La. 70122

Filed Dec. 4, 1978, Ser. No. 965,929
Int. Cl.³ F04B *35/00;* **F01L** *25/06*
U.S. Cl. 417—404 **3 Claims**



1. A vacuum powered air compressor adapted for mounting on a vehicle comprising:

a reciprocating-type air pump having a barrel and a piston reciprocable therewithin;

a double acting pneumatic cylinder assembly for driving said pump, said assembly comprising a tubular member sealed at opposite ends and a complemental plunger supported for axial reciprocation within said member,

said piston and said plunger being mechanically interconnected for reciprocal movement;

valve means for establishing fluid flow communication between said negative pressure source and said double-acting cylinder in a manner to reciprocate said plunger,

said flow control means including a vacuum chamber communicating with said pressure course and a slide valve reciprocable between a first position establishing flow communication between the chamber and one end of said member and a second position establishing flow communication between the chamber and the other end of said member,

said control means further including mechanism for shifting said slide valve to said first position when said plunger is at said one end of said member and for shifting the slide valve to said second position when said plunger is at said other end of the member,

said mechanism including a cylinder with a single closed end and a ram complementally received within said cylinder for reciprocation therewithin, said ram being operably coupled with said slide valve,

there being spring means biasing said ram away from said closed end of the cylinder, said mechanism having a control valve shiftable between a first setting establishing communication between said chamber and said closed end whereby said ram moves in a direction to shift said slide valve to said second position,

said mechanism further including a linkage between said pneumatic cylinder assembly and said control valve, said linkage being operable to shift the control valve to said first setting when said plunger reaches said one end of the member and to shift the control valve to said second setting when said plunger reaches said other end of the member,

said linkage including a pair of push pins each projecting through opposite ends of said member and each being disposed for shifting movement when contacted by said plunger,

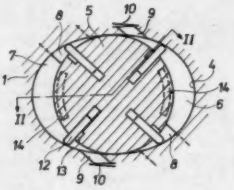
the surface area of said plunger normal to its path of reciprocation being greater than the corresponding surface area of said piston, whereby to increase the maximum positive pressure output of the air pump; and

means for conveying compressed air from said pressure outlet.

4,224,014
ROTARY COMPRESSOR WITH LIQUID INJECTION

Rune V. Glanvall, Norrkoping, Sweden, assignor to Stal Refrigeration AB, Norrkoping, Sweden

Filed Oct. 12, 1978, Ser. No. 950,559
Claims priority, application Sweden, Oct. 13, 1977, 7711559
Int. Cl.[3] F04C *18/00, 29/02*
U.S. Cl. 418—76 3 Claims



1. A rotary compressor of the sliding vane type comprising a housing having an inner surface and provided with inlet ports for a gas to be compressed and with outlet ports for compressed gas, a cylindrical rotor journalled in the housing for rotation about an axis and provided with end walls, the rotor having slots opening through the peripheral surface of the rotor and also having edges in which small recesses are cut, vanes movable in said slots generally radially of the rotor and adapted to slide sealingly against said inner surface of the housing, the vanes being movable periodically inward and outward in the slots during rotation of the rotor, working chambers being formed between the rotor, said inner surface of the housing and the vanes, said housing inner surface including internal end walls opposing said end walls of the rotor and also including a peripheral wall surrounding the rotor, there being grooves for liquid injection in at least one of said housing end walls and positioned to communicate with the working chambers through said edge recesses in the rotor during at least parts of the periods starting when a vane immediately trailing one of said recesses, as seen in the direction of rotation, has just passed a said inlet port, thereby shutting off the connection between said last inlet port and the corresponding working chamber immediately preceding said vane, and ending when the pressure in said corresponding working chamber equals the liquid injection pressure, said outlet ports being located in said peripheral wall of the housing and positioned to communicate with the working chambers independently of said edge recesses during said rotation of the rotor, said recesses being sufficiently small to avoid forming any substantial detrimental volume when passing the inlet and outlet ports in direct communication therewith.

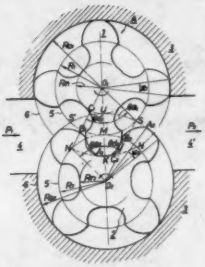
4,224,015
POSITIVE DISPLACEMENT FLOW METER WITH HELICAL-TOOTHED ROTORS

Shigeyoshi Nagata, Tokyo, Japan, assignor to Oval Engineering Co., Ltd., Tokyo, Japan

Filed Jan. 6, 1978, Ser. No. 869,031
Claims priority, application Japan, Jan. 19, 1977, 52-4019; Jul. 25, 1977, 52-89056
Int. Cl.[3] G01F *3/10;* F01C *1/16*
U.S. Cl. 418—150 4 Claims

1. A positive displacement flow meter having a pair of rotors of helical tooth structure to be engageable with each other, wherein the opposite flanks of each tooth have in a section normal to the rotor axes at the addendum the form of a cycloid and at the dedendum the form of a trochoid, and wherein each of said flanks has at the addendum a convexly curved projection extending a small distance radially inwardly of the addendum circle thereof and at the dedendum convexly curved projection extending a short distance radially inwardly of the pitch circle, said rotors engaging each other during their rotation only at said projections.

2. A positive displacement flow meter having a pair of rotors having helical teeth engaging each other in a plane normal to the axes of said rotors, said rotors having the same outer diameters and the same number of teeth respectively inclined to said

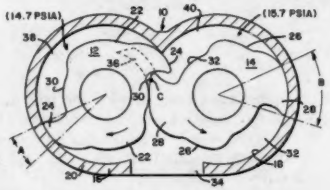


axes at an angle β, and in which $L=i\times(2R\pi/Z)/\tan\beta$, wherein L=the axial length of each rotor, i is an integral number, R the outer radius of each rotor and Z the number of teeth in each rotor.

4,224,016
ROTARY POSITIVE DISPLACEMENT MACHINES

Arthur E. Brown, Box 78, R.D. 1, Lake George, N.Y. 12845

Filed Sep. 27, 1978, Ser. No. 946,320
Int. Cl.[3] F01C *1/08;* F04C *18/08*
U.S. Cl. 418—191 15 Claims



1. A rotary, positive displacement machine, with interengaging rotors having different-sized lobes, adapted to handle a working fluid, comprising:

a casing structure having a pair of intersecting bores;

a first rotor mounted for rotation in one of said bores;

a second rotor mounted for rotation in the other of said bores;

timing gear means constraining said two rotors to rotate in timed, interengaging relation;

said casing structure having a high pressure port for the flow therethrough of working fluid at high pressure;

said casing structure further having a low pressure port for the flow of the working fluid therethrough at lower pressure;

said high pressure port being located in an end wall of said one bore;

said first rotor having means for alternately covering and uncovering said high pressure port, to control flow of working fluid through said high pressure port;

said first rotor further having two lobes; and

said second rotor also having two lobes; wherein

said lobes on said second rotor have substantially larger included angles than said lobes on said first rotor to minimize precompression and concomitant throttling loss in the machine when operated as a compressor, and to minimize expansion loss when operating the machine as an expander;

said lobes on said first and second rotors have peripheral, circumferentially-extended surfaces which define close-clearance interfaces with inner surfaces of their respective bores;

said peripheral surfaces of said lobes of said second rotor each occupying an angle of approximately twice that of said peripheral surfaces of said lobes of said first rotor;

said peripheral surfaces of said lobes of said second rotor each comprising means defining a substantially-extended, circumferential leakage path with said inner surface of said other bore;

said port covering and uncovering means comprises means for wholly covering and uncovering said high pressure port; and

said high pressure port is covered and uncovered only by said first rotor.

4,224,017

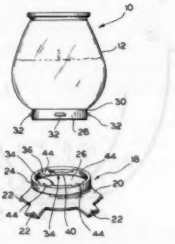
LOCKING ARRANGEMENT FOR A CANDLE

Marvin L. Kayne, Glenwood, Ill., assignor to Valley Candle Mfg. Co., Inc., Chicago, Ill.

Filed Jul. 13, 1977, Ser. No. 815,081

Int. Cl.³ F21L *19/00*

U.S. Cl. 431—291 **3 Claims**



1. A candle comprising:

a glass container member including wax and a wick and having a bottom including a neck extending downward from a shoulder;

a base member having a flexible collar of thin metal or plastic extending upward and defining an opening;

a tongue extending outward from said neck;

said container, neck and tongue being an integral unit of glass,

a retainer means extending inward from said collar inside said opening, said retainer means including a groove to receive said tongue when said neck is positioned in the opening and said container is rotated in the clockwise or in the counterclockwise direction, a first edge angled downward from one point to a lower point and a second edge angled downward from one point to a lower point, said first edge being on one side of the groove and said second edge being on the opposite side of the groove, for contacting the tongue prior to said tongue entering said groove, in either said clockwise or clockwise direction.

4,224,018

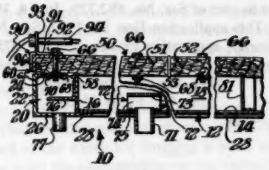
INFRA-RED APPARATUS

Thomas M. Smith, 114 Villinger Ave., Cinnaminson, N.J. 08077

Continuation-in-part of Ser. No. 775,838, Mar. 9, 1977, and Ser. No. 701,687, Jul. 1, 1976, abandoned, each is a continuation-in-part of Ser. No. 674,409, Apr. 7, 1976, Pat. No. 4,035,132. This application Dec. 22, 1977, Ser. No. 863,251

Int. Cl.² F23D *13/12*

U.S. Cl. 431—328 **3 Claims**



1. In a gas-fired infra-red generator having a felted fiber matrix pad with extended surfaces and at least about ¼ inch thick through which pad a gaseous combustion mixture is passed to emerge from one surface and to burn at that surface to heat that surface to incandescence and thus generate infra-red energy, the improvement according to which the matrix pad consists of at least two separate pieces of matrix butted together in edge-to-edge contact, the abutting edge faces being adhered to each other with a layer of silicone rubber not more than about 3 millimeters thick.

4,224,019

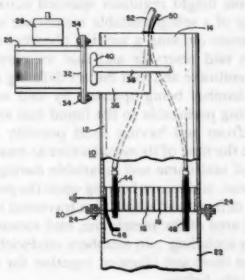
POWER BURNER FOR COMPACT FURNACE

James A. Dilmore, Irwin, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1978, Ser. No. 881,474

Int. Cl.³ F23D *13/40, 13/14*

U.S. Cl. 431—328 **4 Claims**



1. A gaseous fuel, power burner comprising:

a mixing tube having an open burner end and an opposite closed end;

a centrifugal blower structurally carried by said mixing tube and having an outlet connected to a circumferential portion of said mixing tube adjacent said closed end to discharge air generally tangentially into said mixing tube adjacent said closed end;

means for delivering gaseous fuel into the discharge airstream of said blower upstream from the admission location of said airstream into said mixing tube so that said gaseous fuel and air will have a swirling component to promote mixing in the passage of said gaseous fuel and air through said mixing tube;

an openwork refractory member extending across the open burner end of said mixing tube; and

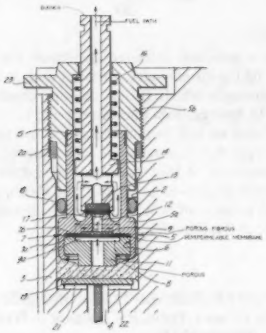
ignition means including a high voltage electrode at said burner end of said mixing tube, for initiating combustion of the mixed fuel and air on the downstream side of said refractory member.

4,224,020

MAXIMUM-FLAME-HEIGHT PRESSURE REGULATOR FOR GAS LIGHTER

Guy Neyret, Francheville, France, assignor to Etablissements Genoud & Cie Societe Anonyme Dite, Venissileux, France

Continuation-in-part of Ser. No. 692,729, Jun. 4, 1976, Pat. No. 4,101,262. This application Dec. 15, 1977, Ser. No. 860,845
Claims priority, application France, Jun. 5, 1975, 75 18161
The portion of the term of this patent subsequent to Jul. 18, 1995, has been disclaimed.
Int. Cl.³ F23D *13/04*
U.S. Cl. 431—344 **11 Claims**



1. In a gas lighter containing a reservoir of a gasifiable liquid fuel, a burner for producing a flame by combustion of said fuel and means establishing a flow passage for said fuel from said reservoir to said burner, the improvement which comprises a maximum flame height regulator spanned across said passage and consisting of a semipermeable membrane wettable by the liquid fuel, means defining a wetting chamber along said passage between said reservoir and said membrane, means between said membrane and said burner defining an evaporation space, said chamber being spanned by said membrane, said membrane being permeable to the liquid fuel as well as to gas formed therefrom and having fixed porosity characteristics determined at the time of its manufacture to establish the maximum height of said flame and invariable during assembly and use of the lighter, and means bearing upon the periphery of said membrane to define an effective area traversed by fuel and less than the total area of the membrane, said means bearing upon said periphery including two members sandwiching said membrane between them and clamped together for insertion as an assembly into the lighter.

4,224,021

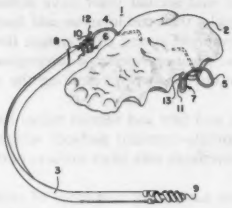
ADJUSTABLE ATTACHMENT FOR A LABIAL ARCH RETAINER

David Foxman, Cedarbrook Hills, Apt. A-311, Wyncote, Pa. 19095

Continuation-in-part of Ser. No. 760,334, Jan. 18, 1977, abandoned. This application Aug. 4, 1978, Ser. No. 931,029
Int. Cl.² A61C *3/00*
U.S. Cl. 433—2 **10 Claims**

1. In a labial arch retainer of the type having a palatal section configured to closely conform to the roof of the mouth of a user, tooth engaging means extending from the palatal section to maintain the retainer in place, band attachment means provided in the tooth engaging means, and a resilient band connectable to the band attachment means to apply retention forces upon the teeth of the user, an improved band connector which comprises

a central body having means for connecting the body to the resilient band and a longitudinal extension having a plurality of spaced means for engaging the band attachment means,



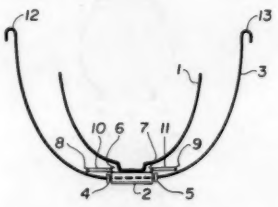
wherein the band attachment means is adapted to adjustably lock the band to the band attachment means.

4,224,022

ORTHODONTIC FACE BOW

Melvin Wallshein, 8645 Bay Pkwy., Brooklyn, N.Y. 11214

Filed Sep. 29, 1978, Ser. No. 946,875
Int. Cl.² A61C *3/00*
U.S. Cl. 433—5 **36 Claims**



1. An orthodontic face bow for applying at least extrusion and/or intrusion forces to teeth, comprising:

an inner bow member having first and second ends to be coupled to respective teeth in a mouth;

an outer bow member coupled to said inner bow member at a substantially central portion thereof;

said inner and outer bow members being rotatably relative to each other;

resilient biassing means coupled between said inner and outer bow members for resiliently biassing one of said bow members relative to the other of said bow members to cause one of said bow members to rotate relative to the other to apply at least one of said extrusion and intrusion forces to the teeth to which said inner bow is coupled; and

means coupled to at least one of said inner and outer bow members for limiting the rotational movement of said inner and outer bow members relative to each other against the relative rotational forces applied by said resilient biassing means to prevent inadvertent unwinding of one bow member relative to the other, thereby preventing injury to a wearer.

4,224,023

DENTAL RESTORATIVE KIT AND METHOD OF RESTORING TOOTH STRUCTURE

Peter P. L. Cheung, Gulph Mills, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Aug. 16, 1976, Ser. No. 714,553
Int. Cl.³ A61K 5/06
U.S. Cl. 433—216 **3 Claims**

1. A dental restoration kit for a dentist to use in restoring a non carious erosion lesion of the cervical region of a tooth, said kit being composed of a particulate solid system, a liquid binder system, an etching solution and a primer, all disposed in separate containers, from each of which containers, a dentist may extract necessary amounts of the materials to produce a dental filling to be made, the quantity of material used to produce the filling will match the color of the tooth in which it is to be placed,

(a) the particulate solid system adapted to be mixed with

(b) for forming the filling material is composed of

(i) 95 to 105 parts of a fine silane treated glass,

(ii) 0.1 to 2 parts of fine silica,

(iii) 0.5 to 2.5 parts of benzoyl peroxide, and

(iv) traces of iron oxide pigment as needed for matching the color of tooth structure; and

(b) the liquid binder system adapted to be mixed with (a) for forming the filling material is composed of

(i) 45 to 65 parts of bisphenol-A/glycidyl methacrylate prepolymer,

(ii) 5 to 25 parts of hydroxyethyl methacrylate

(iii) 15 to 45 parts of ethyleneglycol dimethacrylate,

(iv) 0.001 to 3 parts of methacrylic acid,

(v) 0.03 to 0.2 parts of p-methoxyphenol, and

(vi) 0.05 to 1 parts of N,N-dihydroxyethyl-p-toluidine.

(c) an etching solution of 25 to 50 percent of phosphoric acid adapted to be applied to the tooth for preparing the surface thereof; and

(d) a primer solution of 2 percent N-phenyl glycine/glycidyl methacrylate condensation product in ethanol adapted to be applied to the tooth for forming a bond therewith by chelating with the calcium ions on the etched surfaces of the tooth and copolymerizing with the filling material.

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4,224,024

PROCESS FOR THE REACTIVE DYEING AND PRINTING OF FIBROUS MATERIALS CONTAINING HYDROXY GROUPS WITH A WATER-SOLUBLE ORGANIC DYESTUFF CONTAINING AT LEAST ONE PHOSPHONIC ACID-MONOFLUORIDE GROUP AND AT LEAST ONE IONIC WATER-SOLUBILIZING GROUP

Helmut Gies, Hofheim, and Fritz Meininger, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

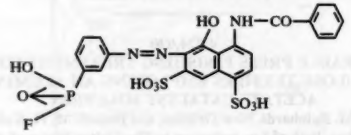
Filed Sep. 10, 1975, Ser. No. 611,881

Claims priority, application Fed. Rep. of Germany, Oct. 26, 1974, 2451005

Int. Cl.[2] D06P *1/06, 1/384, 3/66, 1/10*

U.S. Cl. 8—445 7 Claims

1. A process for the reactive dyeing or printing of a fibrous material containing hydroxy groups, which comprises reactively fixing on the material to be dyed at a pH of 7.5 to 12 a water-soluble organic dyestuff of the formula



6. A fibrous material containing hydroxy groups which was dyed with a water-soluble organic dyestuff containing at least one phosphonic acid-monofluoride group and at least one ionic water-solubilizing group.

4,224,025

PROCESS FOR THE DYEING AND PRINTING OF PAPER MATERIALS IN DIFFERENT HUES USING A SINGLE COUPLING COMPONENT

Arthur Bühler, Rheinfelden, and Franz H. Nedwed, Aesch, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 402,672, Oct. 2, 1973, abandoned. This application Sep. 11, 1978, Ser. No. 941,433

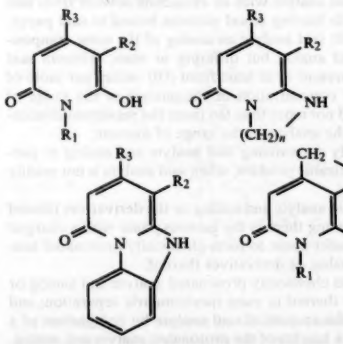
Claims priority, application Switzerland, Oct. 4, 1972, 14559/72

Int. Cl.[2] D21H *1/46*

U.S. Cl. 8—466 3 Claims

1. A process for dyeing or printing paper in different hues, using a single coupling component, comprising the steps of

(1) Applying to the paper a single coupling component selected from the group consisting of



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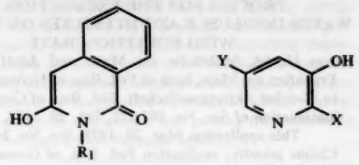


wherein

R_1 is hydrogen, an alkyl group, an acylaminoalkyl group, an aralkyl group, an aryl radical, a heterocyclic radical, an alkylene radical which links the radical of the elected formula with a further similar heterocyclic radical, or an amino group;

R_2 is hydrogen, an alkyl group, cyclohexyl, cyano nitro, nitroso, H_2N-, acylamino group, an alkyl carbonyl or arylcarbonyl group, a sulphonyl group, an aminosulphonyl group, an alkoxycarbonyl or aryloxycarbonyl group, an aminocarbonyl group, a halogen atom, a sulphoalkyl group, a haloalkanoylaminomethyl group, a quaternary ammoniumalkanoylaminomethyl group, a sulfoalkanoylaminomethyl group, a phthalimidomethyl group, an o-benzene disulfonimidomethyl group, a sulfonic acid group, a carboxyl group, a quaternized amino group, a pyridinium group or benzimidazolium group;

R_3 is hydrogen, an alkyl group, an aralkyl radical, an aryl radical, a heterocyclic radical, cyano, an alkoxycarbonyl or aryloxycarbonyl group, an aminocarbonyl group, an alkoxycarbonylmethyl or aryloxycarbonylmethyl group, cyanomethyl, an acylmethyl group, aminocarbonylmethyl, carboxy or hydroxymethyl;

n is 2 or 3;

x is hydroxy or amino; and

Y is hydrogen or halogen;

(2) Applying to one area of the paper a first diazo compound to give one hue in the area where the coupling component and the first diazo compound are applied; and

(3) Applying to a second area of the paper a second diazo compound to give a second hue in the area where the coupling component and the second diazo compound are applied.

4,224,026

PROCESS FOR PREPARING FAST DYEINGS AND PRINTS ON CELLULOSE FIBER MATERIALS AND THEIR MIXTURES WITH SYNTHETIC FIBERS

Friedrich Reinhardt, Bad Soden am Taunus, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 27, 1978, Ser. No. 973,603

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1977, 2758579; Mar. 15, 1978, 2811167

Int. Cl.[3] D06P *3/82*

U.S. Cl. 8—532 18 Claims

1. A process for producing fast colorations on a cellulose material which comprises contacting said materials with an aqueous preparation of a disperse dyestuff containing one or more esterified carboxylic acid groups and fixing the coloration by steaming and/or dry heat in the presence of a compound containing more than one hydroxy and/or amino groups linked to aliphatic carbon atoms to cause said compound to transesterify and/or transamidate at least partially the ester group or groups of said dyestuff.

4,224,027

PROCESS FOR THE PRODUCTION OF WATER-INSOLUBLE AZO DYESTUFFS ON THE FIBER WITH POLYPHOSPHATE

Hasso Hertel, Mühlheim am Main, and Adolf Trampusch, Frankfurt am Main, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 882,222, Feb. 28, 1978, abandoned. This application Mar. 26, 1979, Ser. No. 24,429
Claims priority, application Fed. Rep. of Germany, Mar. 5, 1977, 2709623
Int. Cl.[2] C09B 27/80; D06P 3/12
U.S. Cl. 8—666 2 Claims

1. In a process for the preparation of dyeings by producing metal-free water-insoluble azo dyestuffs on the water according to the methods of the ice color dyeing, in which the fiber material is at first impregnated with a coupling component in an alkaline medium and the thus impregnated material is subsequently developed by treating it, with a developing bath which contains the diazonium compound, the improvement consisting in using a developing bath which contains an alkali metal-tri- or -tetrapolyphosphate, the pH value of the developing bath being greater than 4.5 prior to the coupling and smaller than 9 after the coupling process.

4,224,028

RETARDATION OF THE PUTREFACTION OF HIDES AND SKINS

Geraldine H. Thiele, R.D. #3, Box 280, New Oxford, Pa. 17350

Continuation-in-part of Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, Ser. No. 123,830, Mar. 12, 1971, Pat. No. 3,767,812, Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, Ser. No. 283,663, Aug. 25, 1972, Pat No. 3,828,772, Ser. No. 369,236, Jun. 12, 1973, Pat. No. 3,924,000, Ser. No. 483,010, Jun. 25, 1974, Pat. No. 3,982,017, Ser. No. 642,114, Dec. 18, 1975, Ser. No. 724,942, Sep. 20, 1976, Ser. No. 724,943, Sep. 20, 1976, abandoned, Ser. No. 755,400, Dec. 29, 1976, Pat. No. 4,097,604, Ser. No. 890,239, Mar. 27, 1978, Ser. No. 918,792, Jun. 26, 1978, Ser. No. 918,795, Jun. 26, 1978, Ser. No. 918,817, Jun. 26, 1978, Ser. No. 927,614, Jul. 24, 1978, and Ser. No. 929,119, Jul. 27, 1978. This application Nov. 20, 1978, Ser. No. 961,932
Int. Cl.[2] C14C 1/00, 5/00, 11/00
U.S. Cl. 8—94.18 19 Claims

1. Process for the prevention and/or retardation of the putrefaction of skins, hides, or pelts of animals which comprises treating a skin, hide or pelt from a freshly slaughtered animal, which has not yet been tanned or tawed, with a liquefied composition consisting essentially of a non-necrotic sclerosing fatty acid salt, ethyl alcohol, a buffering agent and a water carrier, said salt being prepared from an unsaturated fatty acid having at least one double bond and from an alkali metal or an alkaline earth metal or an alkali metal compound or an alkaline earth metal compound, and said liquefied composition having a pH between 9 and 11.

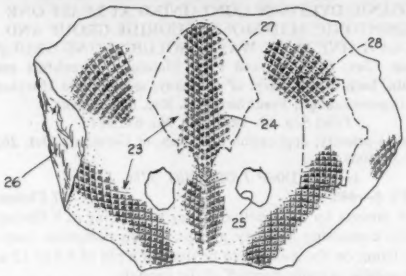
4,224,029

EXOTIC LEATHER, METHOD OF PROCESSING SAME, AND METHOD OF PROCESSING DOMESTIC FOWL

George G. Heinz, Box 72, Rte. 12, Greenville, S.C. 29609

Filed Nov. 27, 1978, Ser. No. 964,129
Int. Cl.[2] C14C 3/00
U.S. Cl. 8—94.19 R 3 Claims

1. The method of preparing exotic leather from skin and adjacent flesh of a domestic fowl comprising the steps of:
storing the skin and adjacent flesh in cold storage;
removing the feathers from the skin and adjacent flesh;
degreasing the skin and adjacent flesh;
subjecting the skin and adjacent flesh to shrinkage; and
tanning the skin and adjacent flesh;



whereby a domestic fowl is processed for food while the skin and adjacent flesh produce an exotic leather.

4,224,030

DURABLE PRESS FINISHING TREATMENT FOR CELLULOSE TEXTILES EMPLOYING AN ALUMINUM ACETATE CATALYST SOLUTION

Robert M. Reinhardt, New Orleans, and Russell M. H. Kullman, Harahan, both of La., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 5, 1979, Ser. No. 1,134
Int. Cl.[2] D06M 13/14, 15/54, 15/58, 9/00
U.S. Cl. 8—115.7 2 Claims

1. In a process for producing durable press properties in cellulose-containing textiles by applying an aqueous solution of crosslinking agent and catalyst, drying, and curing, wherein the improvement comprises: the use as catalyst of an aluminum acetate salt solution containing sodium and chloride ions, prepared by reaction of aqueous aluminum chloride and aqueous sodium acetate.

4,224,031

CI MASS SPECTROMETRIC ANALYSIS OF PHYSIOLOGICALLY ACTIVE COMPOUNDS

John M. L. Mee, 411 Opihikao Pl., Honolulu, Hi. 96825; Berthold Halpern, 88 Ramah Ave., Mt. Ousley, Australia (2500), and John Korth, Lot 66 O'Brien's Rd., Figtree, Australia (2525)

Filed Nov. 15, 1977, Ser. No. 851,666
Int. Cl.[2] G01N 33/16
U.S. Cl. 23—230 B 9 Claims

1. A method for quantitatively determining at least one analyte in blood, wherein the blood sample is a dried spot on absorbent paper, which comprises:
extracting said analyte with an extraction solvent from said paper, while leaving blood proteins bound to said paper;
including with said analyte an analog of the same composition of said analog but differing in mass, wherein said analog is present in at least from 0.01 moles per mole of the lowest concentration of the analyte in the range of interest and not more than ten times the maximum concentration of the analyte in the range of interest;
simultaneously derivatizing said analyte and analog to provide a volatizable product, when said analyte is not readily volatizable;
vaporizing said analyte and analog or the derivatives thereof and protonating them in the gaseous phase with a charged proton transfer agent to form chemically protonated analyte and analog or derivatives thereof;
subjecting said chemically protonated analyte and analog or derivatives thereof to mass spectrometric separation; and
determining the amount of said analyte by comparison of a ratio of peak heights of the protonated analyte and analog.

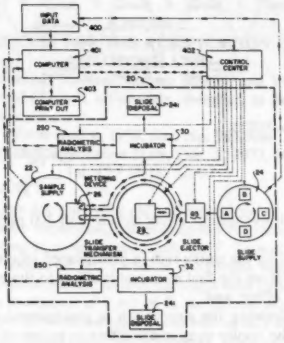
4,224,032
METHOD AND APPARATUS FOR CHEMICAL ANALYSIS

Clyde P. Glover, Pittsford; James E. Ferris, Rochester; Robert J. Meyer, Spencerport, and Edward Muka, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 751,872, Dec. 17, 1976, abandoned. This application Dec. 5, 1977, Ser. No. 857,344

Int. Cl.[2] G01N *33/16, 1/14*

U.S. Cl. 23—230 B **28 Claims**



1. A method of performing chemical analysis of a fluid comprising the steps of:

(a) removing a slide from a stack of slides, each of said slides including means to effect the analysis of a fluid sample;

(b) transporting said slide to a metering position;

(c) metering a predetermined quantity of fluid on said slide;

(d) transporting said slide to incubator means, said incubator means having a plurality of conveyor means;

(e) depositing said slide in a selected one of said conveyor means;

(f) conveying said slide to a position to cooperate with an analysis means after an appropriate period of incubation; and

(g) sensing a characteristic of said slide resulting from the fluid deposited thereon.

4,224,033
PROGRAMMABLE, CONTINUOUS FLOW ANALYZER

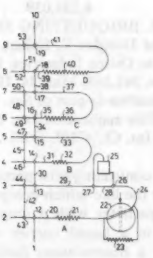
Elo H. Hansen, Lyngby, and Jaromir Ruzicka, Nae Rum, both of Denmark, assignors to Bifok AB, Sollentuna, Sweden

Filed Feb. 16, 1978, Ser. No. 878,265

Claims priority, application Sweden, Feb. 16, 1977, 7701696

Int. Cl.[2] G01N *1/14, 1/18*

U.S. Cl. 23—230 R **15 Claims**



1. A method of analysis in which a continuous flow of a liquid carrier receives sample portions and reagent portions, said method comprising: passing said carrier through a conduit in a manner such that flow of said carrier is laminar, unsegmented and continuous; introducing sample and reagent portions to said carrier at controlled intervals; controlling dispersion of said sample portion in said carrier to optimize chemical reactions taking place between samples and reagents; programming said analysis by varying the intervals at which said reagent is introduced to said carrier; and passing the material to be analyzed through a flow-through detector.

4,224,034
ASSAY OF IRON AND IRON BINDING PROTEIN REAGENTS AND METHODS

Jerry W. Denney, Carmel, and Mark C. Outcalt, Indianapolis, both of Ind., assignors to American Monitor Corporation, Indianapolis, Ind.

Division of Ser. No. 714,481, Aug. 16, 1976, Pat. No. 4,154,929. This application Sep. 7, 1978, Ser. No. 940,350

Int. Cl.[2] G01N *33/16*

U.S. Cl. 23—230 B **20 Claims**

1. A process for detecting the presence of ferrous ions, which includes the step of adding, to the specimen being assayed, 9-(2-pyridyl)-acenaphtho[1,2-e]-as-triazine as both a chelator and indicator of ferrous ion.

14. In a process for the direct serum quantitation of ferrous ion present in serum, the step of adding, to the specimen being assayed, dimethylsulfoxide to increase the liberation of iron bound to transferrin.

15. In the process of quantitatively determining the amount of iron in a serum sample, the procedural step of maintaining the incubation of the sample in the buffer system employed therewith for an extended period sufficient to minimize interferences encountered in the use of hemolyzed samples.

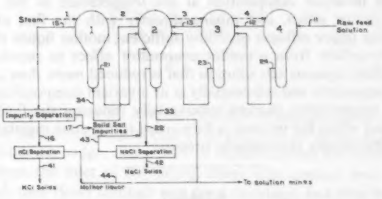
4,224,035
METHOD OF SEPARATING SALTS FROM SOLUTION

Donald H. Geesen, Wilcox, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Apr. 3, 1978, Ser. No. 892,452

Int. Cl.[2] B01D *9/02*

U.S. Cl. 23—296 **13 Claims**

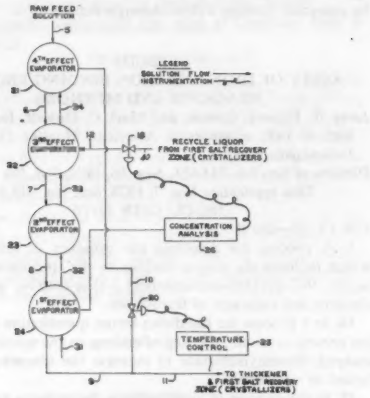


1. In the method of separating a first salt and a second salt from an aqueous solution containing both salts and salt impurities, the solubility of the first salt increasing more with increasing temperatures than the solubility of the second salt, at least a portion of the salt impurities precipitating as crystals with a slower settling rate than that of precipitated second salt, by passing the solution through a series of evaporators, wherein second salt and salt impurities are precipitated in each evaporator, the bottom of each evaporator communicating with an elutriation leg, introducing fluidizing liquid upwardly through the elutriation legs to carry the impurities back to the evaporators while precipitated second salt settles, and withdrawing second salt slurry from each elutriation leg, the improvement which comprises utilizing as the fluidizing liquid evaporator mother liquor effluent overflow having a temperature and salt composition near the temperature and salt composition of the solution in the evaporator communicating with the elutriation leg into which the fluidizing liquid is introduced.

4,224,036
METHOD OF CONCENTRATING SALT SOLUTIONS

Donald H. Geesen, Wilcox, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Apr. 3, 1978, Ser. No. 892,453
Int. Cl.[2] B01D *9/02, 1/26*
U.S. Cl. 23—296 **20 Claims**



1. In the concentration of an aqueous solution containing a first salt and a second salt, the solubility of the first salt increasing more with increasing temperatures than the solubility of the second salt, wherein water is removed from the solution by multiple effect evaporation having a plurality of evaporator effects operated at progressively higher temperatures, the first effect of which is the hottest, and wherein mother liquor effluent overflow from a cooler effect is forwarded to A^2 a hotter A^3 effect and mother liquor effluent overflow from the first effect is forwarded to a zone maintained at substantially atmospheric pressure, the improvement which comprises operating the first evaporator effect at super atmospheric pressure and at least 4° C. above the atmospheric boiling point temperature of the mother liquor therein, the mother liquor being substantially at its invariant composition at the temperature of the first evaporator effect, and mixing directly with the first effect mother liquor effluent overflow sufficient mother liquor effluent overflow from a cooler evaporator effect to provide a resultant aqueous salt solution that is reduced more than 2° C. in temperature and substantially at its invariant composition for that temperature, thereby substantially reducing the flashing thereof when the mixture is forwarded to the zone maintained at substantially atmospheric pressure.

4,224,037
METHOD FOR OPERATING MULTIPLE EFFECT EVAPORATORS

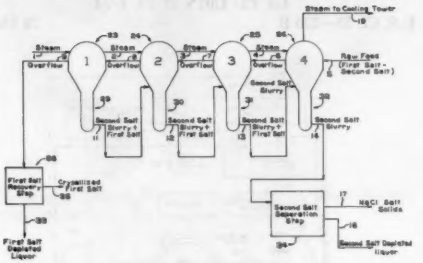
Donald H. Geesen, Wilcox, Canada, assignor to PPG Industries Canada Ltd., Regina, Canada

Filed Apr. 3, 1978, Ser. No. 892,454
Int. Cl.[2] B01D *9/02*
U.S. Cl. 23—296 **8 Claims**

1. In the recovery of a first salt from an aqueous solution containing the first salt and a second salt, the first salt having a solubility increasing more with increasing temperatures than the solubility of the second salt, wherein water is removed from the solution by multiple effect evaporation having a plurality of evaporator effects operated at progressively higher temperatures, the first evaporator effect of which is the hottest, and having backward overflow feed, and wherein mother liquor effluent overflow from the first evaporator effect is forwarded to a first salt recovery step and wherein a slurry rich in precipitated second salt is withdrawn from each evaporator effect, the improvement which comprises operating the multiple effect evaporators to provide a mother liquor effluent overflow from the first evaporator effect which is substantially saturated with respect to first salt by:

(1) maintaining the concentration of first salt in the mother liquor of the first evaporator at 100 percent saturation;

(2) maintaining the concentration of the first salt in the mother liquor of at least one evaporator effect cooler than



the first evaporator effect at less than 100 percent saturation;

(3) recycling the slurry rich in precipitated second salt withdrawn from the first evaporator effect to the cooler evaporator effect; and

(4) withdrawing the slurry rich in precipitated second salt from the cooler evaporator effect as purge of second salt from the system.

4,224,038
PROCESS FOR REMOVING SULFUR FROM COAL

George P. Masologites, Olympia Fields; Emmett H. Burk, Jr., Glenwood; Jin S. Yoo, South Holland, and John A. Karch, Chicago, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed Jun. 19, 1978, Ser. No. 916,666
Int. Cl.[2] C10L *9/10;* **C10B** *57/00*
U.S. Cl. 44—1 SR **19 Claims**

1. A process for reducing the sulfur content of coal comprising:

(1) contacting an aqueous slurry of coal-oil agglomerates at elevated temperature with oxygen; and

(2) recovering coal-oil agglomerates wherein the coal has reduced sulfur content.

2. The process of claim **1** wherein the temperature is from about 150° F. to about 500° F.

3. The process of claim **2** wherein the oxygen is at a pressure of from about 50 to 500 psig.

13. The process of claim **3** wherein a pH of from about 6.5 to 12.0 is maintained by adding a basic material to the aqueous slurry.

4,224,039
COAL BRIQUETTING METHODS

Clay D. Smith, and Douglas V. Keller, Jr., both of Lafayette, N.Y., assignors to Otisca Industries, Ltd., Syracuse, N.Y.

Division of Ser. No. 561,168, Mar. 24, 1975, Pat. No. 4,173,530, which is a continuation-in-part of Ser. No. 423,577, Jan. 14, 1974, abandoned. This application Jan. 15, 1979, Ser. No. 3,423
Int. Cl.[2] C10L *5/00, 5/40*
U.S. Cl. 44—10 R **9 Claims**

1. A method of converting coal particles into a structurally stable briquette or the like which comprises the steps of: contacting the coal particles with a composition comprising a binder dispersed in a liquid carrier which comprises 1,2-difluoroethane or a fluorochloro derivative of methane or ethane, said binder being one which is capable of uniting coal particles into a stable structure and which is soluble or otherwise uniformly dispersable in said binder; removing essentially

all of the carrier to thereby leave only the binder dispersed on the particles of coal; and compacting said particles under pressure into a unitary artifact.

2. A method of converting coal particles into a structurally stable briquette or the like which comprises the steps of: contacting the coal particles with a composition comprising a fuel oil binder dispersed in a liquid carrier which comprises 1,2-difluoroethane or a fluorochloro derivative of methane or ethane; removing the carrier to thereby leave the binder dispersed on the particles of coal; and compacting said particles under pressure into a unitary artifact.

4,224,040

PROCESS FOR THE PURIFICATION OF CHLOROSILANES

Franco Gazzarrini, Novara; Moreno Morici, and Vittorio Trapani, both of Merano, all of Italy, assignors to Smiel S.p.A., Milan, Italy

Filed Dec. 4, 1978, Ser. No. 966,507
Claims priority, application Italy, Dec. 5, 1977, 30371 A/77
Int. Cl.[2] B01D *53/02*
U.S. Cl. 55—71 **7 Claims**

1. A process for purifying chlorosilanes from B, As, Al, P, Sb and organic impurities, comprising the following steps:

(a) adsorbing at room temperature the P, As and Sb impurities by means of AlF_3 and/or anhydrous $MgCl_2$ having high specific surface and/or on slight acid cationic resins, up to a maximum of 1 mg of P, As and Sb impurities per gram of AlF_3 and cationic resins and up to a maximum of 800 mg of the same impurities per gram of anhydrous $MgCl_2$;

(b) adsorbing at room temperature the B and Al impurities by means of basic compounds according to Lewis containing nitrogen, up to a maximum of 2 mg of impurities per gram of said basic compounds;

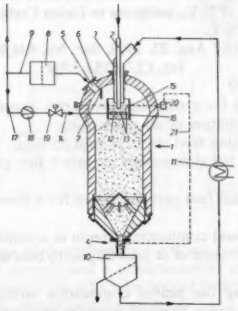
(c) adsorbing at room temperature the organic impurities by means of active coal up to a maximum of 15 mg of impurities per gram of active coal.

4,224,041

APPARATUS FOR THE THERMAL REGENERATION OF LOADED ADSORBENTS

Rolf Noack; Friedhelm Fröhlich; Stefan Gramelt, all of Oberhausen, and Gerhard Kmoch, Bochum, all of Fed. Rep. of Germany, assignors to Deutsche Babcock Aktiengesellschaft, Oberhausen, Fed. Rep. of Germany

Filed Nov. 9, 1978, Ser. No. 959,368
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1977, 2749399
Int. Cl.[2] B01D *53/08*
U.S. Cl. 55—208 **8 Claims**



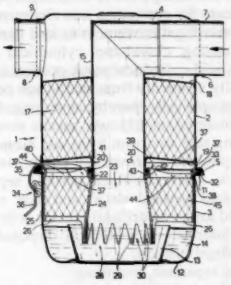
1. Apparatus for thermal regeneration of loaded adsorbents by a hot solid heat carrier, comprising: a container having a head and a base, said head having feed pipes for said adsorbent and said heat carrier, said base having discharge means; a bottom arrangement of pipes located underneath said feed pipes; a gas feed duct outside said container; said gas feed duct being connected to said bottom arrangement of pipes, said adsorbents and said heat carrier having a grain diameter; said bottom arrangement of pipes having gas outlet nozzles; said bottom arrangement of pipes having a spacing of pipes corresponding to a multiple of the grain diameter of said adsorbents and said heat carrier to inhibit downward migration of a layer of said adsorbents and said heat carrier, said bottom arrangement of pipes being below the surface of said adsorbents and said heat carrier, turbulent gas blown through said bottom arrangement of pipes producing turbulence of adsorbents and heat carrier above said bottom arrangement for substantial intensive intermixing of solid materials and heat transfer factors.

4,224,042

OIL BATH AIR CLEANER

Alberto Garigioli, Pisa, Italy, assignor to Whitehead Motofides SpA, Italy

Filed Oct. 25, 1978, Ser. No. 954,660
Claims priority, application Italy, Oct. 25, 1977, 69377 A/77
Int. Cl.[2] B01D *47/02*
U.S. Cl. 55—237 **13 Claims**



1. An air cleaner for internal combustion engines of the type which include a casing having an air inlet and air outlet, at least one filter cartridge, and a pool of liquid therein; and wherein air from the inlet of the casing flows into contact with the liquid, then flows through said filter cartridge, and then flows towards the outlet of the casing: said air cleaner comprising first means to provide a substantially constant ratio between the quantity of air passing through said cleaner and the quantity of liquid associated with the air during its passage, said first means comprising a substantially vertical tubular member having (a) a plurality of spaced teething defining open spaces, at least partially immersed in said pool of liquid, for the passage of air and (b) having a frusto-conical portion at its lower end which includes said spaces and having its wide circumference at the bottom of said portion, and having an inclination of its generating lines of between 5° and 9° relative to its axis; and

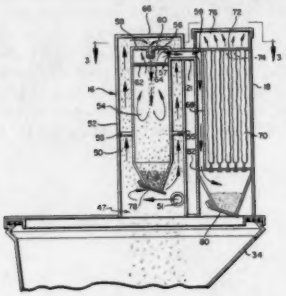
wherein said air flows downwardly through said tubular member, through said spaces in contact with said liquid, and then through said cartridge, and

wherein any increase in air pressure effects a lowering of the liquid level in said pool of liquid in said frusto-conical portion, thereby increasing the area of said spaces and the surface area of liquid contacting said air.

4,224,043
COMPACT MULTISTAGE PARTICLE SEPARATOR

George T. Dupre, Palatine, Ill., assignor to NFE International, Ltd., Palatine, Ill.

Filed Apr. 20, 1978, Ser. No. 898,202
Int. Cl.[3] B01D 50/00
U.S. Cl. 55—319 5 Claims



1. In a portable vacuum collector apparatus for separating particulate material from an airstream, including a movable frame, an elongated centrifugal particle separator, an air filter chamber with a bottom and an input for said airstream and having a plurality of filter elements mounted in said air filter chamber, means for mounting said centrifugal particle separator and said air filter chamber to said frame, said centrifugal particle separator including a lower centrifugal portion with an air inlet and a means for conveying said airstream in a curving path to impart centrifugal movement to said particulate material and an upstanding, closed top, cylindrical stack portion having a bottom, said cylindrical stack portion extending substantially vertically upwardly from said lower portion to convey said airstream upwardly thereby separating the heaviest of said particulate material, and blower means mounted on said frame for directing said airstream from said air inlet to said air filter chamber input, the improvement comprising:

a vertical stack, said centrifugal particle separator being defined by said vertical stack, and said vertical stack including said lower centrifugal portion with said air inlet and said cylindrical stack portion disposed above said lower centrifugal portion;

a linear particle separator, including:

(a) an elongated, substantially vertical, enclosed cylindrical chamber having an orifice at the top thereof for receiving said airstream and a bottom;

(b) an antechamber enclosure extending upwardly from said cylindrical chamber;

(c) nozzle means at the top of said antechamber for receiving said airstream from said centrifugal particle separator and directing said airstream downwardly through said orifice into said cylindrical chamber;

(d) the length of said cylindrical chamber being sized with respect to the velocity of said airstream entering said chamber through said orifice so as to enable a substantial amount of the particulate material to be separated from the airstream and fall and accumulate for collection at the bottom of said cylindrical chamber while the airstream reverses its direction and exits said cylindrical chamber through said orifice;

(e) mounting means for vertically mounting said linear particle separator substantially concentrically within said upstanding cylindrical stack portion of said centrifugal particle separator to align said nozzle means along the concentric axis and guide said airstream being conveyed upwardly in said upstanding cylindrical stack portion to said nozzle means;

(f) said mounting means maintaining said cylindrical chamber bottom located slightly above said lower centrifugal portion air inlet and maintaining said nozzle means located slightly below said closed top of said cylindrical stack portion; and

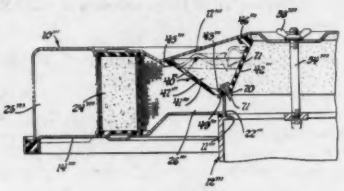
(g) an outlet in said antechamber enclosure; and

duct means, including a duct for interconnecting said outlet to the input of said air filter chamber.

4,224,044
AIR CLEANER WITH VALVE MEANS FOR PREVENTING FUEL VAPOR ESCAPE

Jack B. King, Royal Oak, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 26, 1978, Ser. No. 919,322
Int. Cl.[3] B01D 50/00, 35/14
U.S. Cl. 55—385 R 2 Claims



1. An air cleaner for an induction system of an internal combustion engine, said air cleaner comprising casing means encasing an air filter and having an air inlet for admitting unfiltered air to the filter and an air outlet for delivering filtered air from the filter to the induction system, and a one-piece annular channel shaped bellows valve secured to a closed side of said casing means opposite said air outlet, said bellows valve having spaced-apart elastic annular side walls depending from said closed side of said casing means, said side walls having an annular valve face formed integral therewith, said side walls being self-biased to seat said annular valve face about said air outlet to close same to said air inlet to prevent fuel vapor escape when the engine is not operating, said elastic annular side walls defining a contractible chamber, said chamber having an aspirator open to and pointing downstream in the flow path at said air outlet whereby on aspiration of said chamber caused by said aspirator when the engine is operating, said elastic annular side walls are contracted and thereby unseat said valve face from about said air outlet to open same to said air inlet to permit normal engine operation.

4,224,045
CRYOGENIC SYSTEM FOR PRODUCING LOW-PURITY OXYGEN

Walter J. Olszewski, Tonawanda, and John H. Ziemer, Grand Island, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,093
Int. Cl.[2] F25J 3/04
U.S. Cl. 62—30 22 Claims

1. A process for producing low-purity oxygen by low-temperature rectification of air comprising:

(a) compressing feed air to at least 85 psia,

(b) dividing the compressed air into a first part and second part,

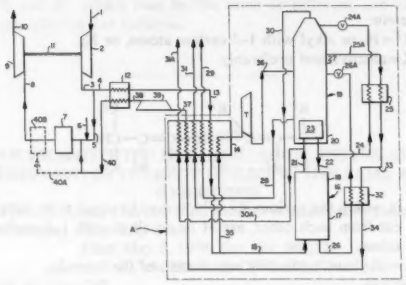
(c) mixing said first part as oxidant for a combustion stream with fuel,

(d) igniting said combustion stream in a combustion zone at ignition pressure of at least 80 psia to heat said combustion stream,

(e) expanding the heated combustion stream in a power turbine to lower pressure with the production of external work,

(f) recovering at least part of said external work as energy for said compressing of feed air,

(g) cooling said second part of compressed air,
(h) introducing the cooled air to a higher pressure rectification stage having its upper end in heat exchange relation with the lower end of a lower pressure rectification stage,
(i) separating said cooled air into oxygen-enriched and nitrogen-rich liquids in said higher pressure rectification stage,
(j) transferring at least part of said liquids from step (i) to said lower pressure rectification stage for separation into low purity oxygen and nitrogen-rich gases,



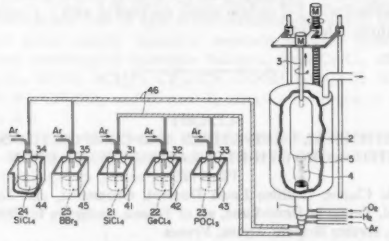
(k) operating said lower-pressure rectification stage at pressure at least 20 psi lower than the step (d) ignition pressure,
(l) discharging a low-purity oxygen product stream and at least one nitrogen-rich gas stream from said lower pressure rectification stage,
(m) compressing at least part of the nitrogen-rich gas discharged in step (l) to pressure at least equal to the step (d) ignition pressure, and
(n) flowing the compressed nitrogen-rich stream into the combustion stream, upstream of said power turbine.

4,224,046

METHOD FOR MANUFACTURING AN OPTICAL FIBER PREFORM

Tatsuo Izawa, Musashino; Toru Kuwabara, Yokohama; Yuichi Masuda, Yokohama, and Yuji Kameo, Yokohama, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sumitomo Electric Industries, Ltd., Osaka, both of, Japan

Filed Aug. 11, 1978, Ser. No. 932,968
Claims priority, application Japan, Aug. 11, 1977, 52-96735
Int. Cl.[3] C03B *19/06, 37/075*
U.S. Cl. 65—3 A **7 Claims**



1. A method of manufacturing a glass preform having a circular cross section and a predetermined radial refractive index distribution, from which an optical communication fiber may be drawn, comprising the steps of:
(a) disposing a start member in spaced axial alignment with a burner tip including a plurality of concentric nozzles,
(b) rotating said start member,
(c) blowing a first gaseous raw glass material having a first dopant concentration which increases the index of refraction of the resulting glass through a central nozzle of said burner tip and toward said start member,
(d) blowing a second gaseous raw glass material having a second dopant concentration which decreases the index of refraction of the resulting glass through a first concentric nozzle of said burner tip surrounding said central nozzle and toward said start member,
(e) blowing an inflammable gas including hydrogen and oxygen through outer concentric nozzles of said burner tip surrounding said first concentric nozzle, whereby soot-like glass particles are synthesized proximate said burner tip through flame hydrolysis by burning said inflammable gas and deposit on the end of said start member,
(f) withdrawing said start member from said burner tip to maintain a substantially constant spacing therebetween, whereby a soot-like glass rod having a circular cross-section is grown on said start member having a predetermined radial dopant concentration distribution, and
(g) heating said soot-like glass rod to render it to be a transparent glass preform having a predetermined radial refractive index distribution.

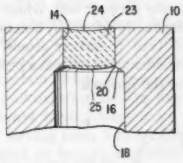
5. A method of manufacturing an optical communication fiber from a preform made in accordance with the method of claims **1**, **3** or **4**, comprising the steps of:
(a) heating the soot-like glass rod at a high temperature to render it transparent, and
(b) drawing the molten rod into a continuous, elongated fiber.

4,224,047

METHOD OF FUSING A SIGHT GLASS TO A METAL PART

Peter A. Kershaw, London, Canada, assignor to The Singer Company, Stamford, Conn.

Filed Jan. 25, 1979, Ser. No. 6,957
Int. Cl.[3] C03C *27/02*
U.S. Cl. 65—39 **7 Claims**



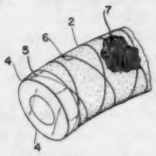
1. A method of making a composite part consisting of a metal part and a sight glass fused thereto comprising:
providing the metal part with a cylindrical opening, a chamfer below the cylindrical opening, and an aperture below the chamfer, and wherein the diameter of the cylindrical opening is less than the diameter of the aperture at the juncture of the aperture and the chamfer;
placing a glass sphere having a diameter slightly larger than the diameter of the cylindrical opening within the cylindrical opening; and
heating the glass sphere sufficiently to soften the glass to the point wherein the softened glass will flow downwardly by gravity through the cylindrical opening only to the juncture of the cylindrical opening and the chamfer, and wherein the downward flow of the softened glass is limited by cohesive forces in the softened glass that substantially prevent the softened glass from flowing radially outwardly along the chamfer, and then cooling the softened glass causing it to become fused to the wall of the cylindrical opening.

4,224,048

OSMOTIC FERTILIZER PRODUCT AND FERTILIZATION METHOD

Edward B. Pendergast, Cresskill, N.J., assignor to Products by Hector, Incorporated, Englewood Cliff, N.J.

Filed Mar. 17, 1978, Ser. No. 887,794
Int. Cl.[2] A01G 29/00
U.S. Cl. 71—11 **6 Claims**



1. A fertilizer product comprising an imperforate reverse osmosis tubular membrane member composed of polyvinyl alcohol; a fertilizer material containing (consisting of) at least one member of the group consisting of (comprising) nitrogen, phosphorous and potassium; said tubular member containing an evenly distributed predetermined quantity of said fertilizer material; and said fertilizer material being released through said tubular member in proportion to the requirements of plant growth.

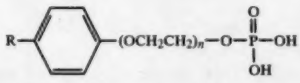
4,224,049

COMPATIBILITY AGENTS AND METHOD OF USE

Bala N. Devisetty, and James R. Hanson, both of Madison, Wis., assignors to Hopkins Agricultural Chemical Co., Madison, Wis.

Filed Nov. 1, 1978, Ser. No. 956,657
Int. Cl.[2] A01N 9/02, 9/36
U.S. Cl. 71—86 **17 Claims**

1. A compatibility agent for improving the uniformity and stability of liquid fertilizer-pesticide mixtures so that the pesticide can be accurately applied to a crop or soil in a predetermined amount by simultaneously applying the pesticide and liquid fertilizer to the crop or soil, which compatibility agent which consists essentially of water, a member selected from a lower alkanol of 1 to 6 carbon atoms, ethanolamine, diethanolamine and triethanolamine and a polyoxyethylene glycol phosphate ester of the formula:



in which R is an alkyl of 6 to 12 carbon atoms, and n is 4 to 8.

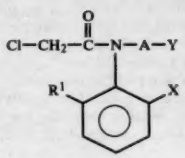
4,224,050

CHLOROACETANILIDES HAVING A SELECTIVE HERBICIDAL ACTIVITY, ORTHO-ALKENYL-SUBSTITUTED ANILINES, INTERMEDIATES IN THE SYNTHESIS OF SAID HERBICIDAL CHLOROACETANILIDES, AND METHODS FOR THEIR PREPARATION

Roberto Colle, Milan; Franco Gozzo, Saronno; Giovanni Camaggi, Lodi, and Giorgio Siddi, S. Donato Milanese, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Feb. 7, 1978, Ser. No. 875,893
Claims priority, application Italy, Feb. 10, 1977, 20153 A/77; May 20, 1977, 23809 A/77; Oct. 20, 1977, 28817 A/77
Int. Cl.[2] A01N 9/12, 9/20; C07C 103/22
U.S. Cl. 71—98 **20 Claims**

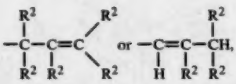
1. A chloroacetanilide of the general formula:



wherein:

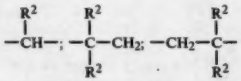
R^1=H, or alkyl with 1–5 carbon atoms, or X;

X=alkenyl, and preferably



in which the various R^2, which may be equal to or different from each other, are H or an alkyl with 1–3 carbon atoms;

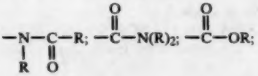
A=alkylene, optionally substituted, of the formula:



in which the various R^2, which may be equal to or different from each other, have the meanings specified above; and

Y=H; alkyl with 1–5 carbon atoms; alkenyl with 2–5 carbon atoms; alkinyl with 2–5 carbon atoms; phenyl; cycloalkyl with 3–8 carbon atoms; halogen; CN; OR; SR;

NHR; $N(R)_2$;



wherein R=H; alkyl with 1–5 carbon atoms; alkenyl or alkinyl with 2–5 carbon atoms; cycloalkyl with 3–8 carbon atoms; phenyl.

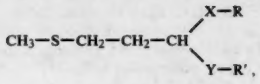
4,224,051

METHIONAL DERIVATIVES AND COMPOSITIONS WITH A GROWTH-REGULATING EFFECT UPON PLANTS

Claude Clapot, Oullins; Louis Dumont, Chaponost, and Jean Vial, Tassin la Demi-Lune, all of France, assignors to Philagro, service Brevets, Lyons, France

Division of Ser. No. 889,856, Mar. 24, 1978, Pat. No. 4,153,442, which is a division of Ser. No. 595,723, Jul. 14, 1975, Pat. No. 4,101,307. This application Mar. 16, 1979, Ser. No. 21,210
Claims priority, application France, Jul. 15, 1974, 74 25781
Int. Cl.[3] A01N 59/02
U.S. Cl. 71—98 **5 Claims**

1. A process for modifying the growth of a plant comprising applying to said plant a growth-modifying amount of a compound of the formula



wherein

X and Y, which may be the same or different, are each O, or S; and

R and R', which may be the same or different, are each lower alkyl of 1–4 carbons.

4,224,052

POLYSUBSTITUTED BUTANOIC ACIDS, ESTERS AND DERIVATIVES THEREOF UTILIZING THE SAME AS HERBICIDES

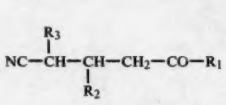
Stephen S. Szucs, Trenton, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 5, 1978, Ser. No. 903,379

Int. Cl.[2] A01N 9/20; C07C 121/52

U.S. Cl. 71—105 **46 Claims**

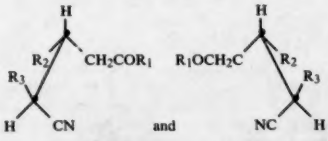
1. A method for the control of undesirable monocotyledonous and dicotyledonous plant species comprising applying to the foliage and stems of said plants or to soil containing seeds or other propagating organs of said plants, a herbicidally effective amount of a compound of formula (I):



wherein R_1 is OH, OR_4, NR_5R_6 or OM; R_2 and R_3 each represent a member selected from the group consisting of

R_4 is alkyl C_1–C_8, monohaloalkyl C_1–C_4, monohaloalkynyl C_3–C_4, monohaloalkenyl C_3–C_4, alkoxy C_1–C_4 alkyl C_1–C_4 or hydroxyalkynyl C_2–C_4; R_5 and R_6 each independently represent members selected from the group consisting of H and alkyl C_1–C_2; M is an alkali metal, ammonium, C_1–C_8 mono or di-alkylammonium or hydroxyethylammonium; and X and Y each independently represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_4, alkoxy C_1–C_4, OCF_3, $OCHF_2$, CF_3, CN, COOH, NO_2, OH, SCH_3, NR_7R_8, CH_3SO_2, and R_7 and R_8 are each hydrogen or alkyl (C_1–C_2).

28. A threo stereoisomer of a polysubstituted butanoic acid or ester represented by a compound having a formula selected from the group consisting of:



wherein R_1 is OH, OR_4 or OQ; R_2 and R_3 each represent members selected from the group consisting of

R_4 is alkyl C_1–C_8, monohaloalkyl C_1–C_4, monohaloalkenyl C_3–C_4, monohaloalkynyl C_3–C_4, alkoxy C_1–C_4 alkyl C_1–C_4, and hydroxyalkynyl C_2–C_4; Q is ammonium, C_1–C_8 mono or di-alkylammonium or hydroxyethylammonium; and, X and Y each independently represent members selected from the group consisting of hydrogen, halogen, alkyl C_1–C_3, OCF_3, CF_3, CN, COOH, OCH_3, NO_2, OH, SCH_3 or CH_3SO_2; and provided that when R_4 is ethyl at least one of R_2 and R_3 is other than phenyl.

4,224,053

BIS-SUBSTITUTED SUCCINAMIDES AND THEIR UTILITY AS HERBICIDES

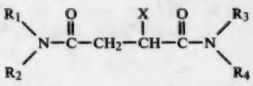
Francis H. Walker, Mill Valley, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 546,234, Feb. 3, 1975, Pat. No. 4,056,524, which is a continuation-in-part of Ser. No. 459,438, Apr. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 410,641, Nov. 12, 1973, abandoned. This application Feb. 21, 1979, Ser. No. 13,092

Int. Cl.[2] A01N 9/20

U.S. Cl. 71—118 **29 Claims**

1. A method for controlling the growth of undesirable vegetation which comprises applying to the area where control of said vegetative growth is desired, an herbicidally effective amount of a compound having the formula



in which X is chlorine or bromine; R_1 and R_3 are each hydrogen, alkyl having from 1 to 8 carbon atoms, inclusive, haloalkyl having from 1 to 6 carbon atoms, inclusive, in which halo is fluorine, bromine and chlorine, alkenyl having from 2 to 6 carbon atoms, inclusive, or alkynyl having from 2 to 8 carbon atoms, inclusive,; R_2 and R_4 are each hydrogen, haloalkenyl having from 2 to 6 carbon atoms, inclusive, in which halo is chlorine or bromine, alkoxyalkyl having from 2 to 8 carbon atoms, inclusive, alkynyl having from 2 to 6 carbon atoms, inclusive, cycloalkyl having from 3 to 8 carbon atoms, inclusive, cyclopropylmethyl, or benzyl; provided that only one of R_1 or R_2 is hydrogen and only one of R_3 and R_4 is hydrogen.

4,224,054

PROCESS FOR THE PRODUCTION OF ALUMINIUM

Frederick W. Southam, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 21, 1978, Ser. No. 962,622

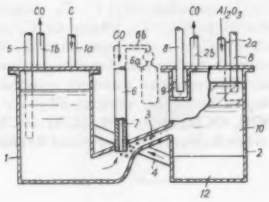
Claims priority, application United Kingdom, Nov. 28, 1977, 49445/77

Int. Cl.[2] C22D 7/02

U.S. Cl. 75—10 R **6 Claims**

1. A process for the production of aluminium metal by the carbothermic reduction of alumina which relies on establishing a circulating stream of molten alumina slag, containing combined carbon, in the form of at least one of aluminium carbide or oxycarbide; circulating the stream of molten alumina slag through a low temperature zone maintained at least in part at a temperature at or above that required for reaction of alumina with carbon to form aluminium carbide (reaction (ii)) but below that required for reaction of aluminium carbide with alumina to release Al metal (reaction (iii)) and introducing

carbon in this zone; forwarding the stream of molten alumina, now enriched in Al_4C_3 as a result of reaction (ii), to a high temperature zone (maintained at least in part at a temperature at or above a temperature required for reaction (iii)); and collecting and removing aluminium metal liberated at said high temperature zone as a result of reaction (iii), the molten alumina slag from the high temperature zone then being forwarded to the same or another low temperature zone whilst introducing alumina into said circulating slag stream at at least one location, wherein circulation of the slag is promoted by the provision of gas from an external pressurised supply at a controllably variable rate.



4,224,055

PROCESS FOR THE PRODUCTION OF ALUMINIUM

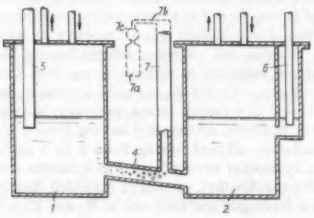
Frederick W. Southam, Kingston, Canada, assignor to Alcan Research and Development Limited, Montreal, Canada

Filed Nov. 21, 1978, Ser. No. 962,652

Claims priority, application United Kingdom, Nov. 28, 1977, 49446/77

Int. Cl.[2] C22D *7/02*

U.S. Cl. 75—10 R **3 Claims**



1. A process for the production of aluminium metal consisting in circulating molten alumina slag between one or more materials addition chambers where reaction of alumina with carbon to form aluminium carbide (reaction (ii)) occurs at a relatively low temperature and one or more high temperature chambers for removal of product aluminium and gas evolved in reaction of aluminium carbide with alumina to release Al metal (reaction (iii)), each materials addition chamber being connected to the succeeding high temperature chamber by a forward connecting conduit which leads into the high temperature chamber through an upwardly directed portion, each high temperature chamber leading into a succeeding materials addition chamber by a return conduit; applying electrical resistance heating of the slag in the forward and return conduits; and adjusting the resistance of the slag in at least one of the conduits by the application of pressurised gas thereto from an external supply, said gas being substantially inert in relation to the alumina slag at the locality where it is introduced.

4,224,056

DIRECT REDUCTION PROCESS FOR IRON ORES WITH FLUIDIZED BED SYSTEM

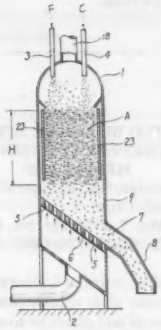
Fumio Tomizawa, Yokohama; Kazuo Sezaki, Funabashi; Makoto Shimizu, Yokosuka, and Yukinaga Katahashi, Yokohama, all of Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1978, Ser. No. 965,211

Claims priority, application Japan, May 24, 1978, 53/62027

Int. Cl.[2] C21B *13/12*

U.S. Cl. 75—11 **9 Claims**



1. A fluidized bed type direct reduction process for iron ores comprising the steps of:

forming a fluidized bed of fine carbon bearing particles within a heated gaseous reducing atmosphere in a reactor,

causing fine iron ore solids to descend through said fluidized bed of carbon bearing particles to thereby reduce said fine iron ore solids by said reducing atmosphere containing the carbon monoxide and the fine carbon bearing particles of said fluidized bed while self-producing said reducing atmosphere containing at least carbon and carbon monoxide, and

removing said fine iron ore solids after reduction from beneath said fluidized bed.

4,224,057

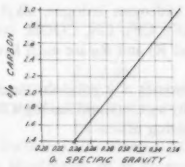
METHOD FOR CARBURIZING SPONGE IRON

Enrique R. Martinez-Vera, and Jorge D. Berrun-Castanon, both of Monterrey, Mexico, assignors to Hylsa, S.A., Monterrey, Mexico

Filed Aug. 20, 1979, Ser. No. 67,665

Int. Cl.[2] C21B *13/02*

U.S. Cl. 75—35 **16 Claims**



1. The method of reducing particulate metal ores to metal particles having a desired degree of carburization in a vertical shaft, moving bed reactor which comprises establishing and maintaining a reduction zone for reducing said particulate metal ore in the upper portion of said bed and a cooling zone for cooling the reduced metal particles in the lower portion of said bed, feeding a hot reducing gas to one point in said reduction zone and causing it to flow through particulate ore in said

reduction zone to a second spaced point in said reduction zone to reduce said ore, removing spent reducing gas from said reactor at said second point in said reducing zone, circulating a carbon-containing cooling gas in a loop comprising said cooling zone and a conduit external to said reactor containing a cooler for cooling and a pump for circulating said cooling gas, measuring the specific gravity of the gas flowing through said loop, adding carbon-containing make-up gas to said loop and effectively regulating the rate of addition of carbon-containing make-up gas to said loop in response to variations in the measured specific gravity to maintain the specific gravity of the gas flowing through said cooling zone and hence the amount of carburization that occurs therein at a desired value.

4,224,058

METHODS OF DESULPHURIZING FLUID MATERIALS

William G. Wilson, Pittsburgh, Pa., and D. Alan R. Kay, Hamilton, Canada, assignors to Molycorp, Inc., Brea, Calif.

Division of Ser. No. 838,945, Oct. 3, 1977, Pat. No. 4,161,400, which is a continuation-in-part of Ser. No. 705,525, Jul. 15, 1976, Pat. No. 4,084,960. This application Apr. 19, 1979, Ser. No. 31,531

Int. Cl.[2] C21C *7/02*

U.S. Cl. 75—58 **7 Claims**

1. A method of desulphurizing fluid materials comprising the steps of reacting a member from the group consisting of rare earth oxides, rare earth fluocarbonates and rare earth oxyfluorides with sulphur to be removed from the fluid material at a sufficiently low oxygen potential to form one of the group consisting of rare earth sulphides and rare earth oxysulphides and mixtures thereof to reduce substantially the unreacted sulphur.

4,224,059

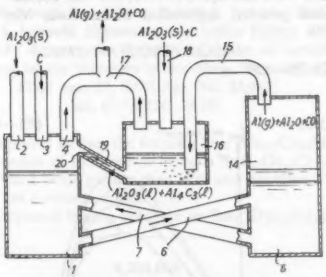
CARBOTHERMIC PRODUCTION OF ALUMINIUM

Raman R. Sood, and Meine Vandermeulen, both of Kingston, Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Aug. 7, 1979, Ser. No. 64,583

Int. Cl.[2] C22B *21/02*

U.S. Cl. 75—68 A **6 Claims**



1. In a process for the production of aluminium metal in which a circulating stream of molten alumina slag containing combined carbon is passed through one or more zones of relatively low temperature at which carbon feed is added for reaction with alumina to form aluminium carbide with evolution of carbon monoxide gas and through one or more zones maintained at a higher temperature such that aluminium carbide reacts with alumina for production of aluminium metal with evolution of further carbon monoxide gas having a content of aluminium suboxide and aluminium vapour higher than that of carbon monoxide evolved in the low temperature zone or zones the improvement which consists in leading a stream of carbon monoxide from a high temperature zone to a pretreatment zone, maintaining a body of molten alumina-containing slag in said pretreatment zone at a temperature below the temperature in said high temperature zone or zones, feeding carbon and alumina to said pretreatment zone, bringing said stream of carbon monoxide into intimate contact with said slag in said pretreatment zone for reacting said slag with a part of the aluminium suboxide and aluminium vapour content of said carbon monoxide stream, discharging from said pretreatment zone to a low temperature zone a stream of excess slag resulting from said reaction and discharging from said pretreatment zone a stream of cooled carbon monoxide having a depleted content of aluminium suboxide and aluminium vapour.

4,224,060

HARD ALLOYS

Marcos H. C. de Souza; Celso A. Barbosa; Ivan G. S. Falleiros; Fabio Y. Mori, and Werner Viertler, all of Sao Paulo, Brazil, assignors to Acos Villares S.A., Sao Paulo, Brazil

Filed Dec. 29, 1977, Ser. No. 866,164

Int. Cl.[2] C22C *39/02*

U.S. Cl. 75—124 **1 Claim**

1. A hard steel alloy having in the as cast and wrought structure idiomorphic, isolated niobium carbides in the case of alloys containing no vanadium and idiomorphic, isolated carbides of vanadium and niobium in the case of alloys containing vanadium consisting of, by weight, 0.7 to 1.50% carbon, 0.1 to 1.0% silicon, 0.15 to 0.50% manganese, up to 0.03% phosphorous, up to 0.20% sulfur, 3.50 to 6.0% chromium, 0 to 10.0% molybdenum, 0.0 to 10.0% tungsten, 0.0 to 4.0% vanadium, 0.2 to 12.0% cobalt, up to 0.08% nitrogen, up to 0.25% aluminum, 0.1 to 7.0% niobium, the balance iron and incidental impurities.

4,224,061

HIGH CORROSION RESISTANT AND HIGH STRENGTH MEDIUM CR AND LOW NI STAINLESS CAST STEEL

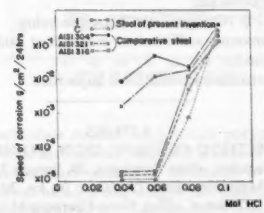
Hisashi Hiraishi, Kyoto; Toshiaki Morichika, Hirakata; Shinichi Murakami, Osaka, and Katsutaro Akamatsu, Hirakata, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Division of Ser. No. 862,987, Dec. 20, 1978, abandoned. This application Jul. 28, 1978, Ser. No. 929,296

Claims priority, application Japan, Jun. 30, 1977, 52/79195

Int. Cl.[2] C22C *39/20*

U.S. Cl. 75—125 **4 Claims**



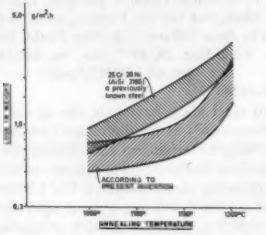
1. A method of producing a high corrosion resistant and high strength medium Cr and low Ni stainless cast steel which consists of the steps of first preparing a molten material substantially of Fe, adding to said Fe material the following components: C: 0.1% and below, Si: 1.5% and below, Mn: 2.0% and below, P: 0.04% and below, S: 0.04% and below, Cr: 17.0% to 20.0%, Ni: 3.0 to 7.0%, Mo: 1.5% to 2.5%, Cu: 5.0% to 7.0%, N: 0.1% and below in weight percentage to form the base material and casting the base material to form a stainless cast steel.

3. A high corrosion resistant and high strength medium Cr and low Ni stainless cast steel which consists essentially of, in weight percentage, C: 0.1% and below, Si: 1.5% and below, Mn: 2.0% and below, P: 0.04% and below, S: 0.04% and below, Cr: 17.0% to 20.0%, Ni: 3.0% to 7.0%, Mo: 1.5% to 2.5%, Cu: 5.0% to 7.0%, N: 0.1% and below and the remaining portion substantially of Fe to form the material of said stainless cast steel.

4,224,062
HIGH TEMPERATURE CREEP RESISTANT STRUCTURAL STEEL

Sven Darnfors, Avesta, Sweden, assignor to Avesta Jernverks Aktiebolag, Avesta, Sweden

Continuation-in-part of Ser. No. 862,818, Dec. 21, 1977, abandoned, which is a continuation of Ser. No. 607,957, Aug. 26, 1975, abandoned. This application Jan. 24, 1979, Ser. No. 5,974
Claims priority, application Sweden, Aug. 24, 1974, 7410791
Int. Cl.[2] C22C *38/40*
U.S. Cl. 75—128 E **10 Claims**



1. A structural member having improved high temperature creep resistance such that it exhibits only about 1% creep when subjected to a load of 16 Newtons per square millimeter for 1000 hours at a temperature of up to about 900° C., said member being formed from a fully austenitic steel alloy consisting of the following ingredients in percentages by weight:

0.002–0.12% total content of two elements, the first element being selected from the group consisting of the alkaline earth metals, calcium, strontium and barium and the second element being selected from the group consisting of the rare earth metals, lanthanum and other lanthanides, at least some portion of each element being present;

0.0–0.20% Carbon;

1.0–3.0% Silicon;

0.2–2.0% Manganese;

15.0–25.0% Chromium;

5.0–20.0% Nickel;

0.12–0.22% Nitrogen, said Nitrogen being added in amounts sufficient to assure that said alloy is fully austenitic; and

remainder iron and incidental impurities.

4,224,063
METHOD OF USING IRON MODIFIER

Lev V. Peregudov, ulitsa Puzakova, 39, korpus 3, kv. 231; Mikhail M. Malashin, ulitsa Liteizina, 74, kv. 30, both of Tula; Anatoly S. Naletov, ulitsa Novo-Cheremushkinskaya, 38, kv. 67, Moscow, and Nikolai S. Martynets, Krasnoarmeisky prospekt, 26, kv. 26, Tula, all of U.S.S.R.

Division of Ser. No. 873,664, Jan. 30, 1978. This application Apr. 26, 1979, Ser. No. 33,498
Int. Cl.[2] C22C *33/00*; C21C *7/00*
U.S. Cl. 75—129 **2 Claims**

1. A method of using a modifier containing in percent by weight:

Silicon	25 to 50
Rare Earth Metals	20 to 40
Carbon	10 to 30
Sulphur	0.1 to 0.3
Iron	the balance,

comprising the step of adding the components of said modifier into liquid iron in the form of a mixture of silico-mishmetal and foundry coke, the silico-mishmetal comprising the silicon, rare earth metals and iron, the mixture having the following proportions in percent by weight:

silico-mishmetal	70 to 90
foundry coke	10 to 30.

4,224,064
METHOD FOR REDUCING IRON CARBIDE FORMATION IN CAST NODULAR IRON

Paul J. Bilek, Danbury, Conn.; William A. Henning, Lewiston, N.Y.; Thomas K. McCluhan, North Tonawanda, N.Y., and Julian M. Dong, Youngstown, N.Y., assignors to Union Carbide Corporation, New York, N.Y.

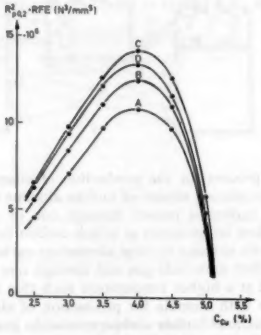
Filed Apr. 27, 1979, Ser. No. 34,128
Int. Cl.[2] C22C *33/08*
U.S. Cl. 75—130 R **7 Claims**

1. In the production of cast nodular iron from molten iron which has been contacted with a graphite-spheroidizing agent in an amount sufficient to yield from about 0.02 to about 0.07 percent by weight of the graphite-spheroidizing agent in the cast nodular iron, a method to reduce the formation of iron carbides in said cast nodular iron which comprises after-treating said molten iron previously contacted with said graphite-spheroidizing agent with an alloy consisting essentially of about 45 percent to 80 percent by weight silicon, 0.5 percent to 1.5 percent by weight calcium, 0.5 percent to 2.5 percent by weight magnesium, 0.5 percent to 1.5 percent by weight aluminum, 0.5 percent to 1.5 percent by weight cerium, 0.5 percent to 1.5 percent by weight barium balance essentially iron.

4,224,065
ALUMINUM BASE ALLOY

Jean-Claude Jaquet, Schaffhausen, Switzerland; Manfred Heckler, Singen, Fed. Rep. of Germany, and Heinrich Zoller, Aesch, Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Apr. 27, 1979, Ser. No. 33,856
Claims priority, application Switzerland, May 19, 1978, 5451/78
Int. Cl.[3] C22C *21/00, 21/22*
U.S. Cl. 75—139 **8 Claims**

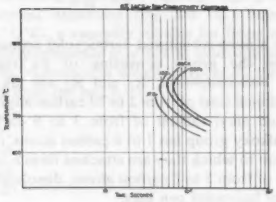


1. An aluminum base alloy having a good combination of strength, toughness and corrosion resistance consisting of from 4.0 to 5.0% copper, from 0.1 to 0.2% cadmium, from 0.2 to 1.0% manganese, a material selected from the group consisting of from 0.1 to 0.4% zirconium, from 0.1 to 0.2% vanadium and mixtures thereof, and the balance aluminum.

4,224,066
COPPER BASE ALLOY AND PROCESS

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Jun. 26, 1979, Ser. No. 52,291
Int. Cl.[2] C22C 9/00; C22F 1/08
U.S. Cl. 75—153 11 Claims



1. A copper base alloy having high strength, high electrical conductivity and reduced quench sensitivity, consisting essentially of from about 0.05 to 1.25% by weight chromiun, from about 0.05 to 1.0% by weight zirconium, from about 0.01 to 0.15% by weight iron, and the balance essentially copper.

7. A process of forming a copper base alloy comprising:

casting an alloy consisting essentially of chromium from about 0.05 to 1.25% by weight, zirconium from about 0.05 to 1.0% by weight, iron from about 0.01 to 0.15% by weight, and the balance essentially copper;

hot working said alloy with an initial temperature of from about 930° C. to 1000° C. and with a finishing temperature greater than about 700° C;

quenching said hot worked alloy from said finishing temperature to a temperature less than about 300° C;

precipitation annealing said alloy at a temperature from about 350° C. to 550° C. for a period of greater than 30 minutes.

4,224,067
PERMANENT MAGNET MATERIALS

Frederick Rothwarf, Toms River; Robert L. Bergner, Randolph; Herbert A. Leupold, Eatontown, and Arthur Tauber, Elberon, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Apr. 27, 1979, Ser. No. 33,911
Int. Cl.[3] C22C 19/00
U.S. Cl. 75—170 22 Claims

1. A compound having the formula $Sm_{1.8}Er_{0.2}Co_{16}Mn_1$.

7. Compounds of the general formula $Sm_{2-x}Gd_xCo_{17-y}Mn_y$ wherein x has a value greater than zero and less than 0.7, and wherein y has a value less than 2.1.

17. A compound having the formula $Sm_{1.8}Dy_{0.2}Co_{16}Mn_1$.

4,224,068
METHOD OF MAKING DISTRIBUTOR ROTOR ELECTRODE CONTAINING DIELECTRIC BODIES FOR SUPPRESSING RADIO FREQUENCY INTERFERENCE

Douglas J. Harvey, Sterling Heights, Mich., assignor to General Motors Corporation, Detroit, Mich.

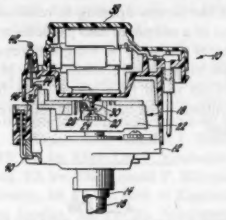
Filed Sep. 14, 1978, Ser. No. 942,460
Int. Cl.[3] B22F 5/00
U.S. Cl. 75—206 2 Claims

1. A method of making a spark erosion resistant distributor rotor electrode containing irregularly shaped dielectric particles dispersed in an electrically conductive metal matrix for suppressing radio frequency interference, said method comprising:

fusing a first mixture comprising silica and copper oxide to form a microscopic interspersion of said constituents in a friable solid material;

comminuting said material to a powder, the powder particles being characterized by their irregular shapes and an average particle size of 50 microns or less;

combining an amount of said powder with a powder of an electrically conductive metal or metals to form a uniform second mixture comprising from about 0.5 to 15 weight percent silica;



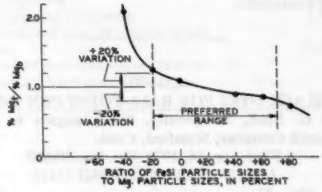
pressing said second mixture into a compact for a rotor electrode body; and

sintering said compact in a reducing atmosphere to form a densified rotor electrode body.

4,224,069
TRANSPORTATION STABLE MAGNESIUM AND IRON DILUENT PARTICLE MIXTURES FOR TREATING MOLTEN IRON

Michael M. Shea, and John F. Watton, both of Mt. Clemens, Mich., assignors to General Motors Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 812,757, Jul. 5, 1977. This application Jul. 19, 1978, Ser. No. 926,080
Int. Cl.[2] B22F 9/00
U.S. Cl. 75—255 3 Claims



1. A bulk particulate mixture from which portions may be withdrawn to treat molten cast iron with a desired amount of magnesium, said mixture consisting essentially of a substantially homogeneous blend of one weight part magnesium metal particles and from about 12 to 20 weight parts iron constituent particles selected from the group consisting of iron and iron alloys, the size of substantially all the particles being in the range of from about 0.15 to 5.0 millimeters and the size distribution characterization value of the said magnesium particles and said iron constituent particles before mixing each being in the range of from about 1 to 2.3, said characterization value being defined as the ratio of the screen opening in millimeters retaining 10 weight percent of a sample of said particles to the screen opening in millimeters retaining 90 weight percent of the same sample, the ratio of the size distribution characterization value of the iron constituent particles to the magnesium particles being in the range of from about 0.8 to 1.7, the said size distributions of the magnesium and iron constituent particles cooperating in the bulk mixture to resist segregation of the magnesium during shipping, handling or storage.

3. A bulk particulate mixture for treating molten cast iron with magnesium, said mixture consisting essentially of a blend of one weight part magnesium metal particles and from about

12 to 20 weight parts iron constituent particles selected from the group consisting of iron and iron alloys, the size of substantially all of the particles being in the range of from about 0.15 to 5.0 millimeters and the size distribution characterization value of the said magnesium particles and the said iron constituent particles before they are mixed each being in the range of from about 1 to 2.3, said characterization value being defined as the ratio of the screen opening in millimeters retaining ten weight percent of a sample of said particles to the screen opening in millimeters retaining 90 weight percent of said sample, and wherein the magnesium content of any portion of said bulk mixture varies no more than about 20% from the average magnesium content of the entire bulk mixture even after agitation and storage.

4,224,070

CHLORIDE SALT-SILICON CONTAINING SLAG COMPOSITIONS FOR CAST IRON MELTS

William V. Youdelis, 1935 W. Grand Blvd., Windsor, Ont., Canada (N9E 1G6)

Filed Mar. 19, 1979, Ser. No. 21,875
Int. Cl.[2] C22B *9/10*
U.S. Cl. 75—257 **10 Claims**

1. A chloride salt-silicon containing composite comprised of:
(a) from 20% to less than 90% by weight of a salt composition containing at least one of the salts selected from barium chloride and calcium chloride; and
(b) more than 10% and up to 80% by weight of a ferrosilicon base alloy, said ferrosilicon base alloy containing at least 10% by weight silicon, up to 25% by weight magnesium, up to 2% by weight of at least one member selected from aluminum and cerium or equivalent rare earths, and the remainder essentially iron; the amount and silicon content of the ferrosilicon base alloy selected to give at least 5% by weight silicon in the said chloride salt-silicon containing composite.

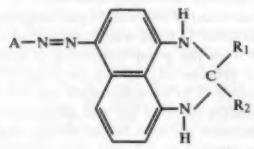
4,224,071

BLACK DYES FOR BALL-POINT PEN INKS

Bennett G. Buell, Bridgewater, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Apr. 16, 1979, Ser. No. 30,680
Int. Cl.[2] C09B *29/22*; **C09D** *11/18*
U.S. Cl. 106—22 **16 Claims**

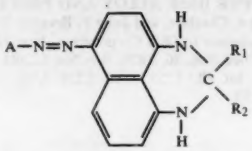
1. A dye compound, useful in ball-point inks, represented by formula (I)



(I)

wherein A is a nitro-substituted carbocyclic aromatic radical selected from the group consisting of 2-nitrophenyl, 4-nitrophenyl, 2-nitronaphthyl, 4-nitronaphthyl, 2-nitroanthryl, and 4-nitroanthryl, R_1 and R_2 are alkyl radicals having a combined total of from 2 to 10 carbon atoms, carbalkoxy substituted alkyl radicals of from 3 to 9 carbon atoms wherein the alkoxy group has 1 to 6 carbon atoms, or together with the carbon to which they are attached from a carbocyclic aliphatic ring of from 5 to 8 carbon atoms.

9. An ink composition for ball-point pens comprising an effective amount of a dye compound of formula (I)



wherein A is a nitro-substituted carbocyclic aromatic radical selected from the group consisting of 2-nitrophenyl, 4-nitrophenyl, 2-nitronaphthyl, R_1 and R_2 are alkyl radicals having a combined total of from 2 to 10 carbon atoms, carbalkoxy substituted alkyl radical of from 3 to 9 carbon atoms wherein the alkoxy group has 1 to 6 carbon atoms, or together with the carbon to which they are attached form a carbocyclic aliphatic ring of from 5 to 8 carbon atoms, dissolved in a vehicle suitable for ball-point pen inks.

4,224,072

PIT AND FISSURE SEALANT FOR TEETH

Lygia Stewart, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Sep. 11, 1978, Ser. No. 941,063
Int. Cl.[3] C09K *3/00*
U.S. Cl. 106—35 **5 Claims**

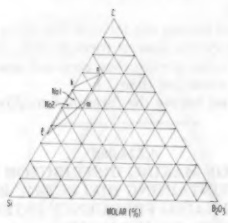
1. A sinterable coating composition capable of being sintered in situ on a tooth surface by a low power laser, said coating composition comprising a slurry of hydroxyapatite and a sufficient amount of a compatible eutectic containing a fluoride compound to lower the sintering temperature of said composition to less than about 700° C.

4,224,073

ACTIVE SILICON CARBIDE POWDER CONTAINING A BORON COMPONENT AND PROCESS FOR PRODUCING THE SAME

Tadao Sasaki, Takarazuka; Takasi Natori, Higashiosaka, and Isamu Komaru, Ashiya, all of Japan, assignors to Nippon Crucible Co., Ltd., Tokyo, Japan

Filed Aug. 4, 1978, Ser. No. 931,065
Claims priority, application Japan, Aug. 4, 1977, 52-93613
Int. Cl.[3] C04B *35/56*
U.S. Cl. 106—44 **3 Claims**



1. A process for producing an active silicon carbide powder containing a boron component, which comprises mixing carbon powder of a particle size of about 20 μm or less, metallic silicon powder and a boron oxide powder as starting materials, so that the molar % of each component in the ternary system of carbon (C), silicon (Si) and boron oxide (B_2O_3) falls within the region defined by the area k, l, m and n in the FIGURE, heating the resulting mixture in an oxidizing atmosphere containing about 0.3 to about 35 volume % of oxygen to induce a spontaneous continuous reaction at a temperature of about 800° to about 1,450° C., said reaction being substantially instantaneously completed.

4,224,074

NON-TOXIC FRITS FOR DECORATING GLASS, GLASS-CERAMIC AND CERAMIC ARTICLES

Richard F. Reade, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 1, 1979, Ser. No. 80,496
Int. Cl.[2] C03C *7/00, 3/14*
U.S. Cl. 106—48 **2 Claims**

1. A frit exhibiting good glass stability, high gloss, a coefficient of thermal expansion (20°–300° C.) between about $50–110\times10^{-7}$/°C., a viscosity suitable for firing at 650°–775° C., and excellent resistance to attack by acids and bases consisting essentially, expressed in weight percent on the oxide basis as calculated from the batch, of:

SiO_2: 29–55
B_2O_3: 7–31
Al_2O_3: 2–8
ZrO_2: 5–16
Na_2O: 4–20
Li_2O: 0–7
Na_2O+Li_2O: 6–24
F: 0.75–4

4,224,075

MATERIAL FOR MAKING POURABLE AND PASTE-LIKE MATERIALS

Peter Mast, Ottenhofenerstr. 24, 7580 Bühl-Weitenung, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 852,681, Nov. 18, 1977, abandoned, which is a continuation-in-part of Ser. No. 691,977, Jun. 2, 1976, abandoned. This application Jan. 9, 1979, Ser. No. 2,006
Claims priority, application Fed. Rep. of Germany, Jun. 5, 1975, 2524983
Int. Cl.[3] C04B *35/46*
U.S. Cl. 106—55 **3 Claims**

1. A homogeneous mass for making pourable and paste-like compounds consisting of a minimum of only 5 parts solidifiable binder and correspondingly up to 95% mineral sand, which includes the improvement in combination therewith comprising: a mineral sand containing titanium oxide, the grains of said mineral sand not exceeding a size of 0.2 millimeters and having exclusively a smooth surface for firm stable mechanical strength of masses produced and similar to that of pebble stones, the grains having multi-point contact with each other bringing about a high mechanical pressure resistance, said binder being specifically a synthetic resin.

4,224,076

NON-PLASTIC HYDRAULIC CEMENT MIXES AND PROCESS FOR IMPROVING SUCH MIXES

Santanu Moitra, Cleveland, and Philip A. Rosskopf, South Euclid, both of Ohio, assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Dec. 11, 1978, Ser. No. 968,412
Int. Cl.[2] C04B *7/35*
U.S. Cl. 106—90 **27 Claims**

1. A method for increasing the strength of non-plastic hydraulic cement mixes comprising incorporating into a hydraulic cement mix an additive comprising

(a) a salified alkyl-substituted aryl sulfonate, wherein the aryl group is either benzene or naphthalene and the alkyl substitution is by one or two methyl or ethyl groups; and

(b) a tertiary aliphatic amine oxide in which two of the aliphatic groups are selected from the group consisting of relatively short alkyl and alkanol chains containing 1 to 3 carbon atoms, and the third aliphatic group is a relatively long chain containing 10 to 18 carbon atoms; and

wherein the amount of said aryl sulfonate incorporated in said cement mix is about 0.01 to about 1%, and the amount of said amine oxide incorporated in said cement mix is about 0.001 to about 0.1%, all percents being by weight of the cement in the cement mix.

4,224,077

RAW MIX FOR THE PRODUCTION OF PORTLAND CEMENT CLINKER

Vladimir P. Olifer, ulitsa Lenina, 14, kv. 4; Sergei P. Berezkin, ulitsa Lenina, 7, kv. 12, both of Nikolaevskaya oblast, poselok Olshanskoe; Pavel N. Galkin, ulitsa 40 let Sovetskoi Ukrainy, 78, kv. 32, Zaporozhie; Anatoly I. Ternovoi, ulitsa Florentsii, 9, kv. 9, Kiev; Alexandr A. Rogatkin, ulitsa 40 let Sovetskoi Ukrainy, 76, kv. 3, Zaporozhie; Nikolai I. Stovba, Strategicheskoe shosse, 11, kv. 16, Kiev; Lev P. Feofanov, ulitsa 40 let Sovetskoi Ukrainy, 82, kv. 130; Leonid P. Khlopkov, ulitsa 40 let Sovetskoi Ukrainy, 24, kv. 11, both of Zaporozhie; Anna I. Tryastsina, ulitsa Lenina, 13, kv. 26, Nikolaevskaya oblast, poselok Olshanskoe; Lidia I. Lekalova, ulitsa 40 let Sovetskoi Ukrainy, 58, kv. 39, Zaporozhie; Larisa A. Telina, ulitsa Nemirovicha-Danchenko, 14, Zaporozhie, and Vera I. Mikheeva, ulitsa Patrioticheskaya, 58, kv. 115, Zaporozhie, all of U.S.S.R.

Filed Apr. 30, 1979, Ser. No. 34,652
Claims priority, application U.S.S.R., May 10, 1978, 2606851
Int. Cl.[2] C04B *7/38*
U.S. Cl. 106—100 **3 Claims**

1. A raw mix composition for the production of portland cement clinker, consisting of a lime component, a clay component, an iron-containing component, and a modifying additive which comprises hydrolysis and yeast production waste liquors and products of neutralization of chlorine-containing off-gas from titanium and magnesium production, with the following proportions of components (% by weight):

lime component	50–52
clay component	7.5–10
iron-containing component	1–1.5
hydrolysis and yeast production waste liquors	30–38
products of neutralization of chlorine-containing off-gas from titanium and magnesium production	1–9.

4,224,078

TREATMENT OF GYPSUM PLASTER

Thomas A. Pilgrim, Edwalton, England, assignor to BPB Industries Limited, London, England

Continuation-in-part of Ser. No. 819,150, Jul. 26, 1977, abandoned. This application Dec. 28, 1978, Ser. No. 973,919
Claims priority, application United Kingdom, Jul. 26, 1976, 31113/76; Oct. 21, 1976, 43773/76
Int. Cl.[2] C04B *11/00*
U.S. Cl. 106—110 **6 Claims**

1. A method of removing salt from gypsum plaster supplied to a manufacturing process for the production of set gypsum products which comprises rapidly and continuously mixing a continuous supply of dry salt-bearing gypsum plaster with a flow of water having a temperature below the hydration transition temperature of gypsum at which rapid hydration of gypsum plaster can occur and continuously separating a substantial portion of the water containing dissolved salt from the plaster, the time elapsing between mixing of the plaster with water and separating a substantial proportion of the water being less than 30 seconds thereby ensuring that unacceptable hydration does not occur, and conveying the damp or wet plaster to the manufacturing process.

4,224,079

ASPHALTIC PAVING COMPOSITIONS AND METHOD OF PREPARATION FROM SOLVENT REFINED COAL

Wilton F. Espenscheid, De Soto, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 20, 1978, Ser. No. 897,977
Int. Cl.[3] C08L 95/00
U.S. Cl. 106—274 4 Claims

1. A process for preparing asphaltic pitch-like compositions from coal suitable for use as paving binders and coating compositions which comprises blending comminuted solvent refined coal with 0.5 to 50 percent by weight sulfur, heating the mixture with agitation at a temperature of 250° to 800° F. for a period of time sufficient to effect dispersion of sulfur therein, and thereafter recovering a flowable heavy oil having a pitch-like consistency.

4,224,080

METHOD OF TREATING INORGANIC OXIDE PIGMENTS

Hubert H. Chambers, Waltham, and Brian J. Tear, Grimsby, both of England, assignors to Laporte Industries Ltd., Bedfordshire, England

Continuation of Ser. No. 816,263, Jul. 18, 1977, abandoned. This application Oct. 10, 1978, Ser. No. 949,877
Claims priority, application United Kingdom, Jul. 28, 1976, 31503/76
Int. Cl.[2] C09C 1/36
U.S. Cl. 106—308 Q 12 Claims

1. A method for producing particles of titanium dioxide pigment useful for dispersion in aqueous or organic media, which comprises; in sequence,

precipitating onto particles of titanium dioxide an inorganic oxide surface coating comprising alumina;

washing the inorganic oxide coated particles to remove dissolved salts;

treating the washed particles by contacting them with an aqueous solution of an agent selected from the group consisting of the water soluble reaction product of

(i) an equivalent excess of an organic hydroxy acid selected from the group consisting of di- and tribasic hydroxy acids, with

(ii) an alcohol containing from 2 to 6 hydroxyl groups; and salts thereof;

said reaction product containing unesterfied carboxyl groups; said treating being conducted while the washed particles are in an aqueous medium; and

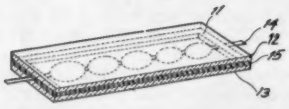
washing, drying and milling the treated particles; whereby there is obtained a grade of pigment which will disperse in both aqueous and organic media.

4,224,081

SOLAR CELL SEALED BY GLASS LAMINATIONS

Koichi Kawamura, Nara; Junichi Honda, Nara; Junichirou Hisatomi, Tenri, and Junichiro Shigemasa, Yamatokoriyama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 26, 1975, Ser. No. 635,377
Claims priority, application Japan, Nov. 27, 1974, 49-137535
Int. Cl.[2] H01L 31/04
U.S. Cl. 136—251 11 Claims



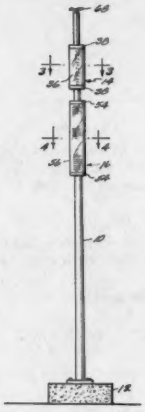
1. A solar cell assembly comprising first and second glass sheets which are transparent to and transmissive to solar radiation, said glass sheets being spaced apart by at least one spacer member adhesively provided at the peripheral edge portion of said glass sheets, said glass sheets and spacer member defining a cavity therebetween, one or more solar cells disposed in said cavity, said cavity further containing a filler material for embedding and potting the solar cells therein and said spacer member comprising one or more openings through which said filler material may be injected.

4,224,082

MULTI-FUNCTIONAL SOLAR COLLECTOR POLE

J. Merritt Jacobson, Boynton Beach, Fla., assignor to Independent Power Company, Inc., Palm Beach, Fla.

Filed Jun. 26, 1979, Ser. No. 52,209
Int. Cl.[2] H01L 31/04; F24J 3/02
U.S. Cl. 136—248 13 Claims



1. A solar energy collector comprising:

a pole adapted to be vertically disposed;

a solar energy to heat transducer mounted on said pole;

a solar energy to electrical energy transducer mounted on said pole;

means for conducting heat generated by said heat transducer from said heat transducer; and

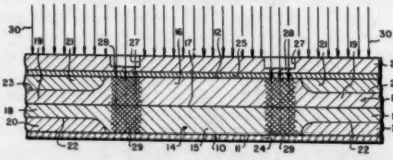
means for conducting the electrical energy generated by said electrical energy transducer from said electrical energy transducer.

4,224,083

DYNAMIC ISOLATION OF CONDUCTIVITY MODULATION STATES IN INTEGRATED CIRCUITS

Michael W. Cresswell, Pittsburgh, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 639,337, Dec. 10, 1975, abandoned, which is a continuation-in-part of Ser. No. 357,435, May 4, 1973, abandoned. This application Jul. 31, 1978, Ser. No. 929,624
Int. Cl.[2] H01L 7/54, 29/747, 9/12
U.S. Cl. 148—1.5 12 Claims



1. A method of dynamically isolating conductivity modula-

tion state in a component of an integrated circuit comprising the steps of:

A. forming an integrated circuit including at least first and second components having at least one common active region in a semiconductor body having at least one major surface, said first component being capable of operating in a conductivity modulation state;

B. selectively masking portions of the major surface at the first and second components of the integrated circuit against a radiation source; and

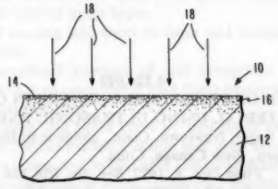
C. selectively irradiating portions of the active common region between the first and second components through substantially unmasked portions of said major surface from said radiation source to dynamically isolate conductivity modulation in the first component from the second from commutating into the second component through the common active regions by recombining injected carriers in the irradiated portions and reducing below a tolerable level the conductivity modulation before entering the second component.

4,224,084

METHOD AND STRUCTURE FOR PASSIVATING A SEMICONDUCTOR DEVICE

Jacques I. Pankove, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 16, 1979, Ser. No. 30,704
Int. Cl.[2] H01L *21/26, 21/265*
U.S. Cl. 148—1.5 **12 Claims**



1. A method of passivating a semiconductor device having at least one active component disposed in a crystalline region thereof comprising the steps of:

converting a part of said region adjacent a surface of said crystalline region into an amorphous layer of graded crystallinity, and

exposing said amorphous layer to atomic hydrogen, whereby an integral layer of hydrogenated amorphous semiconductor material is formed adjacent said crystalline region.

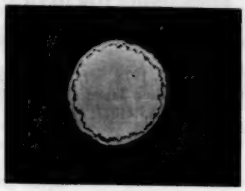
4,224,085

WIRE FORMING PROCESS

Thomas A. Brendel, Maybrook, N.Y., and Pierre P. Turillon, Ramsey, N.J., assignors to The International Nickel Co., Inc., New York, N.Y.

Filed Jul. 21, 1978, Ser. No. 926,754
Int. Cl.[2] B22F *3/24;* **C21D** *1/74, 9/08, 1/80*
U.S. Cl. 148—11.5 P **3 Claims**

1. A process for producing copper-cored titanium wire of maximum 16 gauge comprising filling a titanium metal tube with powdered copper to provide a packed powder density of about 50% to 80% theoretical, sealing said filled tube, and carrying out a multiplicity of operations comprising annealing the filled tube and cold drawing the annealed structure through a die to provide a wire of 16 gauge or finer said operations being characterized by a ratio of initial die size to final wire die size is in the range of 10 to 500.



4,224,086

DIP BRAZING FLUX

John J. Stokes, Jr., Murrysville, and James H. Crooks, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed May 17, 1979, Ser. No. 40,157
Int. Cl.[2] C22B *9/10*
U.S. Cl. 148—26 **8 Claims**

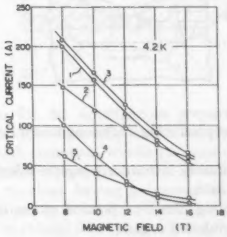
1. A molten dip brazing flux for brazing aluminum alloys containing NaCl, KCl, $CaCl_2$ and at least one fluoride salt selected from the group consisting of sodium, potassium, lithium and aluminum fluoride, the flux characterized by formation of CaF_2 in an amount not greater than 5.0 wt.% of the total flux when it is maintained in molten condition for an extended period of time.

4,224,087

METHOD FOR PRODUCING NB_3SN SUPERCONDUCTOR

Kyoji Tachikawa, and Hisashi Sekine, both of Tokyo, Japan, assignors to National Research Institute for Metals, Tokyo, Japan

Filed Feb. 28, 1979, Ser. No. 16,273
Claims priority, application Japan, Sep. 14, 1978, 53-112191
Int. Cl.[2] H01L *39/00;* **C22C** *27/02;* **C21D** *9/52*
U.S. Cl. 148—133 **5 Claims**



1. In a method for producing Nb_3Sn superconductors which comprises forming a composite consisting of a core portion and a sheath portion surrounding said core portion, said sheath portion being composed of a Cu-Sn alloy, and said core portion being composed of a Nb metal; elongating said composite; and heat-treating the resulting elongated composite to form an Nb_3Sn layer between said sheath and core portions; the improvement wherein the Cu-Sn alloy contains 1 to 20 atomic percent of Sn and the Nb metal is an Nb alloy containing 0.1 to 30 atomic percent of Hf.

4,224,088
METHOD FOR MANUFACTURING A SEMICONDUCTOR DEVICE

Shigeru Komatsu, Yokohama, and Hiroshi Inoue, Tokyo, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

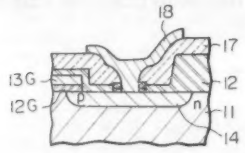
Filed Oct. 24, 1978, Ser. No. 954,325
Claims priority, application Japan, Oct. 26, 1977, 52-127566
Int. Cl.[2] H01L 21/22
U.S. Cl. 148—187 5 Claims

1. A method for manufacturing a semiconductor device comprising a first step for preparing a silicon body, a second step for forming first and second n-type regions by depositing phosphorus separately on two portions on said body, a third step for forming a polycrystalline silicon layer on said first n-type region, and a fourth step for heating to diffuse phosphorus within said first and second n-type regions, to form a shallow first diffused region and a deep second diffused region separately in said body.

4,224,089
PROCESS FOR PRODUCING A SEMICONDUCTOR DEVICE

Keiji Nishimoto, and Shinpei Tanaka, both of Yokohama, Japan, assignors to Fujitsu Limited, Kanagawa, Japan

Filed Dec. 21, 1978, Ser. No. 971,692
Claims priority, application Japan, Dec. 29, 1977, 52-160296
Int. Cl.[3] H01L 21/225
U.S. Cl. 148—187 18 Claims

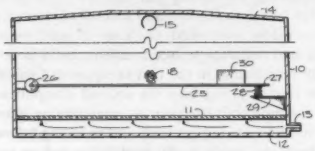


1. A process for producing a semiconductor device comprising the steps of:
- forming an impurity-introduced region within a semiconductor substrate;
- forming a masking film on a portion of the surface of said impurity-introduced region;
- forming an impurity-containing glass film on a surface of said semiconductor substrate including said masking film;
- opening a precursory window in a portion of said impurity-containing glass film over said masking film;
- smoothing the surface of said impurity-containing glass film by heating it;
- removing a portion of said masking film within said precursory window to provide a completed window for receiving an electrode contact; and
- forming an electrode connected to said impurity-introduced region surface through said completed window.

4,224,090
POWDER FILLING OF ELECTRIC CABLES, WITH CABLE VIBRATING MEANS

John N. Garner, Pointe Claire, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Jun. 26, 1979, Ser. No. 52,233
Int. Cl.[2] H01B 13/16
U.S. Cl. 156—48 21 Claims

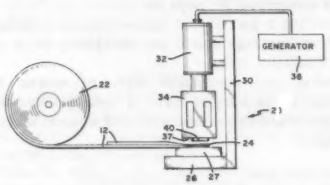


1. A method of powder filling electric cables, comprising:
- forming a fluidized bed of filling powder, passing a cable unit through the fluidized bed of powder, the unit in a substantially closed condition;
- vibrating the cable unit in a direction substantially normal to the direction of movement of the cable unit through the fluidized bed.

4,224,091
METHOD OF PRODUCING CORNERS IN CHANNEL MATERIAL USING ULTRASONIC ENERGY

Thomas B. Sager, Newtown, Conn., assignor to Branson Ultrasonics Corp., New Canaan, Conn.

Filed Dec. 1, 1977, Ser. No. 856,394
Int. Cl.[3] B32B 31/18; A47G 1/06
U.S. Cl. 156—73.3 8 Claims

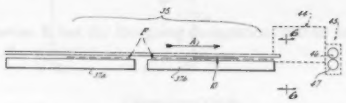


1. Method of producing a corner in a molded or extruded thermoplastic flexible channel material having a base portion and at least one leg comprising:
- flattening the leg outwardly away from the base portion while simultaneously folding the material with a "U" bend upon itself to provide respectively an overlapped base portion and an overlapped leg portion;
- applying ultrasonic energy to the overlapped flattened leg portion for simultaneous sealing and cutting the overlapped leg portion at an oblique angle to the longitudinal axis of said flexible channel material, and
- releasing said flattened and sealed channel material, thereby restoring said channel material to its original shape whereby the material exhibits a formed corner.

4,224,092
METHOD FOR MAKING ALL-PLASTIC HEAT-SEALABLE CONTAINER

Kenneth P. Thompson, Canton, N.C.; Richard C. Ihde, Strongsville, Ohio, and Clarence E. Roth, Orange, Tex., assignors to Champion International Corporation, Stamford, Conn.

Division of Ser. No. 702,018, Jul. 2, 1976, Pat. No. 4,126,262.
This application Aug. 10, 1978, Ser. No. 932,509
Int. Cl.[3] B29D *23/04;* B32B *27/32*
U.S. Cl. 156—82 4 Claims



1. A method of making a multiple-layer composite blank product in flattened tube form from which containers can be made, said blank comprising a composite sheet having a core layer of high density thermoplastic polymeric material having a specific gravity of about 0.950 to about 0.965, a thickness of 15 mils to about 17.5 mils, and a first pre-determined softening point, and at least one outer layer of lower density thermoplastic polymeric material on a side of said core layer, said outer layer having a specific gravity of about 0.918 to about 0.930, a thickness of about 0.75 mils to about 2.0 mils, and a second pre-determined softening point lower than said first pre-determined softening point such that said outer layer, at unconfined edge portions of said blank can be dynamically heated to sufficient molten condition for heat sealing while said core layer is not significantly thermally affected, and provides structural support for said outer layer without distortion or shrivelling, said method comprising the steps of

co-extruding said layers to form a composite sheet having a core layer and an outer layer;

cutting and scoring said sheet to form said composite container blank;

passing unconfined portions of said composite container blank through an open flame, said flame impinging on said unconfined portions;

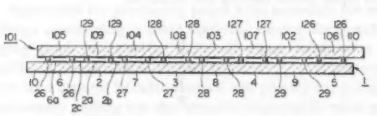
thereby heating said outer layer by said flame to a molten condition for heat-sealing, while said core layer remains thermally insensitive to said heat and structurally supports said tacky outer layer in an undistorted condition; and,

joining tacky portions of said composite container blank to form a side-seamed tube.

4,224,093
METHOD FOR PRODUCING LIQUID CRYSTAL DISPLAY ELEMENTS

Masaharu Kohyama; Tadashi Ishibashi, and Rokuro Watanabe, all of Mobara, Japan, assignors to Hitachi, Ltd., Japan

Filed Jun. 1, 1979, Ser. No. 44,380
Claims priority, application Japan, Jun. 2, 1978, 53/65826
Int. Cl.[2] B32B *7/00*
U.S. Cl. 156—99 3 Claims



1. A method for producing liquid crystal display elements, comprising the steps of:

defining, with at least one boundary line, first regions and second regions disposed alternately on the surface of a glass substrate;

forming transparent electrode segments having desired patterns on said first regions, and forming transparent electrodes having desired shapes on said second regions;

forming layers of bonding agent, said layers having a predetermined width and thickness and extending within said second regions along said boundary line and the edge of said glass substrate;

combining said glass substrate with another glass substrate prepared through all the above mentioned steps in such a manner that one substrate is kept at a predetermined distance from another and that said first regions of said one substrate are opposite to said second regions of said other substrate while said second regions of said one substrate are opposite to said first regions of said other substrate;

forming a glass substrate assembly by bonding said glass substrates together through a heat treatment of said bonding agent;

forming linear scratches in the surfaces of said glass substrates, said surfaces having no electrode formed thereon and said linear scratches corresponding in position to said boundary lines;

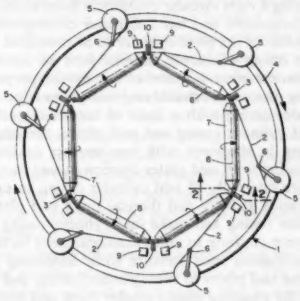
splitting said substrates along said linear scratches; and

filling the spaces enclosed by said glass substrates and said bonding agent layers, with liquid crystal.

4,224,094
METHOD AND APPARATUS FOR SIMULTANEOUS PRODUCTION OF PLURAL HOLLOW FIBER DEVICES BY WINDING

Charles Amicel, Carrieres sur Seine; Bernard Biot, Craponne; Yves Butruille, Ferrolles-Attilly, and Christian Ollivier, Vienne, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation of Ser. No. 791,023, Apr. 26, 1977, abandoned.
This application Dec. 15, 1978, Ser. No. 969,848
Int. Cl.[2] B65H *81/00*
U.S. Cl. 156—169 15 Claims



1. A process for the simultaneous preparation of several hollow fiber devices especially useful for fluid fractionation operations, which comprises winding at least one hollow fiber around at least three members located in such a manner as to obtain a fiber envelope having polygonal section, advancing the fiber envelope on the at least three members, cutting the fiber envelope in at least three places during the winding of the hollow fiber and the advancing of the envelope so as to obtain at least three distinct groups of hollow fiber lengths, the hollow fiber lengths being held during the cutting of the envelope, collecting and arranging the groups so as to obtain, with each one, hollow fiber lengths firmly fixed between two end walls, the latter being in different planes and at the extremities of the hollow fiber lengths which pass through the end walls and which leave their extremities open.

13. An apparatus for the simultaneous preparation of several hollow fiber devices which comprises in combination:

at least three rods threaded along at least part of their

lengths and located in such a manner as to obtain, when a hollow fiber is wound around them, an envelope having a polygonal shape,

means for rotating each rod about its longitudinal axis,

means for cutting the envelope in at least three places during its progress over the rotating rods,

means for arranging and collecting each group of hollow fiber lengths in order to obtain with each one, hollow fiber lengths firmly fixed between two end walls.

4,224,095

METHOD OF MAKING A PLATE CYLINDER FOR A WEB PRINTING PRESS

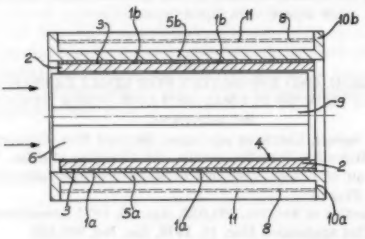
Gualtiero Giori, Lonay, Switzerland, assignor to De La Rue Giori S.A., Lausanne, Switzerland

Filed May 8, 1978, Ser. No. 903,696

Claims priority, application Switzerland, May 9, 1977, 5743/77

Int. Cl.[2] **B32B** *31/20;* **B21D** *39/04;* **B29C** *17/02;* **B41F** *27/00*

U.S. Cl. 156—215 **9 Claims**



1. A method of producing a plate cylinder for web printing presses, comprising providing a hollow cylindrical multi-part mould having a right circular cylindrical inner surface which is precisely concentric and has a diameter corresponding to the outer diameter of the plate cylinder to be produced, preparing a cylinder casing of ductile material with an outer diameter smaller than the inner diameter of said mould, preparing arcuate printing plates and assemblying said plates edge-to-edge on said cylinder casing with a layer of hardenable adhesive between said cylinder casing and said plates, the edges of said plates being in abutment with one another positioning said cylinder casing with said plates thereon in said mould, applying pressure internally of said cylinder casing to expand said cylinder casing radially and thereby press said plates against said cylinder casing and make said cylinder casing with said plates thereon conform to said cylindrical inner surface of said mould, maintaining such pressure while hardening said adhesive to bond said plates to said cylinder casing, and thereafter removing the resulting plate cylinder from said mould.

4,224,096

LASER SEALING OF THERMOPLASTIC MATERIAL

Richard F. Osborne, Mauldin, S.C., assignor to W. R. Grace & Co., Duncan, S.C.

Division of Ser. No. 641,858, Dec. 17, 1975, Pat. No. 3,989,778. This application Mar. 25, 1976, Ser. No. 670,328

Int. Cl.[2] **B29C** *27/02;* **B29D** *9/04*

U.S. Cl. 156—380 **4 Claims**

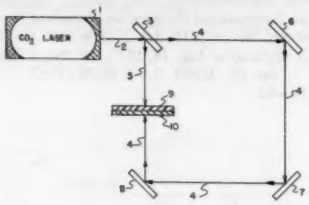
1. An apparatus for sealing together thermoplastic sheets comprising, in combination:

(a) a laser energy source for emitting a laser beam;

(b) a beam splitter for dividing said beam into two components;

(c) pneumatic clamping means for holding a selected area of each of two sheets of thermoplastic material in intimate contact; and,

(d) reflective surfaces for directing said beam components to opposed sides of said area of intimate contact so that one beam component impinges upon said area from a direction opposite to the other whereby the beam energy deposited



in said sheets in the vicinity of said area causes the materials of said sheets to flow and fuse together.

4,224,097

SOLVENT BONDING OF HIGH ACRYLONITRILE COPOLYMERS

Herbert Talsma, East Cleveland; Charles L. Blanchard, Chagrin Falls, and Anita E. Waggy, Ashville, all of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Nov. 24, 1978, Ser. No. 963,473

Int. Cl.[2] **C09J** *5/02*

U.S. Cl. 156—307.3 **7 Claims**

1. The method for bonding together surfaces of a high acrylonitrile copolymer comprising treating at least one of the surfaces with an organic solvent bonding agent and then bringing the surfaces in contact with one another wherein the high acrylonitrile copolymer is one prepared by the polymerization of 100 parts by weight of

(A) from 60 to 90% by weight of at least one nitrile having the structure

$$CH_2=\underset{\displaystyle R}{\underset{|}{C}}-CN$$

wherein R is hydrogen, a lower alkyl group having from 1 to 4 carbon atoms, or a halogen, and

(B) from 10 to 40% by weight based on the combined weight of (A) plus (B) of at least one member selected from the group consisting of

(1) styrene,

(2) an ester having the structure

$$CH_2=\underset{\displaystyle R_1}{\underset{|}{C}}-COOR_2$$

wherein R_1 is hydrogen, an alkyl group having from 1 to 4 carbon atoms, or a halogen, and R_2 is an alkyl group having from 1 to 6 carbon atoms,

(3) an alpha-olefin having the structure

$$CH_2=\underset{\displaystyle R''}{\underset{|}{\overset{\displaystyle R'}{\overset{|}{C}}}}$$

wherein R′ and R″ are alkyl groups having from 1 to 7 carbon atoms,

(4) a vinyl ether selected from the group consisting of methyl vinyl ether, ethyl vinyl ether, the propyl vinyl ethers, and the butyl vinyl ethers,

(5) vinyl acetate, and

(6) indene,

in the presence of from 0 to 40 parts by weight of

(C) a rubbery polymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene and optionally at least one comonomer selected from the group consisting of styrene, a nitrile monomer having the structure

$$CH_2=C(R)-CN$$

wherein R has the foregoing designation, and an ester having the structure

$$CH_2=C(R_1)-COOR_2$$

wherein R_1 and R_2 have the foregoing designations, said rubbery polymer containing from 50 to 100% by weight of polymerized conjugated diene and from 0 to 50% by weight of comonomer wherein the bonding agent is selected from the group consisting of ethylene oxide, propylene oxide, epichlorohydrin, epibromohydrin, 2-furaldehyde, methyl furylketone, oxazole, 1,3-dioxolane, and 3-methoxy propionitrile.

4,224,098

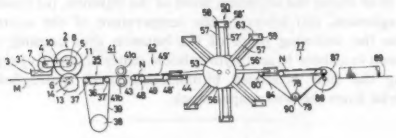
APPARATUS FOR PRODUCING PAPER TUBE ASSEMBLY FOR NURSING SEEDLINGS

Shozo Oikawa; Reiji Takeda, both of Obihiro; Mamoru Sunaga, Hokkaido; Yoshiyuki Kawatsu, and Michinori Sakaki, both of Obihiro, all of Japan, assignors to Nippon Tensai Seito Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 13, 1979, Ser. No. 65,965

Int. Cl.³ B32B *31/00*; A01G *9/00*

U.S. Cl. 156—512 **5 Claims**



1. Apparatus for producing paper tube assembly for nursing seedlings comprising a paste applying device for parallel arranging tapes or tape-like flattened paper tubes of a given breadth in longitudinal direction thereof, overlapping said bodies by a desired breadth thereof and pasting them together, continuously pulling out the strip-like material formed into the form of a half-feather pattern, and carrying out the application of paste in such a way that non-paste portions of a given length are provided at given intervals on the surface; a device for continuously cutting the length of the provided non-paste portions as a unit; and a direction reversing device having rotary carrier tables and non-rotary carrier tables mounted alternately for receiving and carrying the cut pieces horizontally and adapted to rotate as a whole.

4,224,099

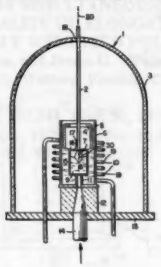
METHOD FOR PRODUCING R-PLANE SINGLE CRYSTAL ALPHA ALUMINA

William C. McGill, Poway, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 656,736, Feb. 9, 1976, abandoned, which is a continuation-in-part of Ser. No. 484,257, Jun. 28, 1974, abandoned. This application Aug. 10, 1978, Ser. No. 932,629

Int. Cl.² B01J *17/18*

U.S. Cl. 156—605 **5 Claims**



1. In a process for the production of massive unicrystalline alpha alumina by

(i) forming a melt of alumina by heating the same to form a melt at a temperature of at least 2040° C.,

(ii) inserting a seed rod of alpha alumina into the melt,

(iii) maintaining an atmosphere over the melt which is substantially chemically inert to the melt,

(iv) withdrawing the seed rod from the melt such that alumina material is solidified and crystallized on the seed rod to form a massive unicrystalline product of increasing length having a growth axis common with the longitudinal axis of the seed rod, the improvement for producing massive unicrystalline R-plane alpha alumina of substantially circular cross-section which comprises

(a) forming a melt of alumina with at least one oxide selected from the group consisting of chromium oxide, iron oxide and magnesium oxide, the aggregate amount of selected oxide provided from about 90 ppm to 20,000 ppm in the aggregate of selected metal ion in the melt to provide a unicrystalline product of substantially circular cross-section, and

(b) employing as the seed rod a seed rod of unicrystalline alpha alumina at a C-axis orientation of 57½° having an orientation such that its growth axis is normal to an R-plane of said seed rod.

4,224,100

METHOD AND APPARATUS FOR MAKING CRYSTALS

Robert A. Hartzell, Morris Plains, N.J., assignor to Litton Systems, Inc., Morris Plains, N.J.

Filed Jun. 16, 1978, Ser. No. 916,422

Int. Cl.² B01J *12/10*

U.S. Cl. 156—617 M **10 Claims**

1. A method, which avoids the use of a liquid-cooled crucible, for making single crystals from a metallic oxide which has a high electrical conductivity at high temperatures, comprising the steps of:

(a) selecting a base which is nonsusceptible to RF energy;

(b) placing a plurality of spaced apart elongated members which are nonsusceptible to RF energy upon said base to form a peripheral outline of a container incorporating said base;

(c) lining the peripheral outline formed by said elongated

spaced apart members with a felt of said metallic oxide to form a porous container;

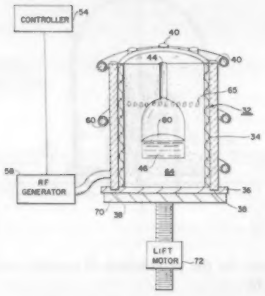
(d) pouring said metallic oxide in said pourous container to form a nonrigid mass;

(e) forming in said nonrigid mass a vent for venting the interior thereof;

(f) positioning said nonrigid mass retained in said porous container in an RF field having a power input;

(g) heating by RF field said nonrigid mass to form a melt in the interior thereof while the interface between said melt and said nonrigid mass forms a shell;

(h) moving at least a portion of said mass within and relative to the RF field;



(i) maintaining the power input to said RF field within a predetermined range over a first preselected period of time to retain and expand said melt while retaining the outer peripheral surface of said porous container and said nonrigid mass adjacent to said felt which forms said container below the melting point of said mass by heat loss from said peripheral surface to prevent said shell from reaching said peripheral surface;

(j) reducing power to said RF field to zero over a second, subsequent, preselected period of time; whereby said melt within said nonrigid mass is cooled by heat loss from said peripheral surface to form said single crystals.

4,224,101

METHOD OF MANUFACTURING SEMICONDUCTOR DEVICES USING LASER BEAM CUTTING

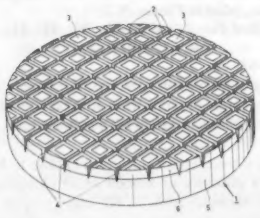
Rudolf P. Tijburg, and Cornelus P. T. M. Damen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 824,504, Aug. 15, 1977, abandoned. This application Dec. 11, 1978, Ser. No. 968,643

Claims priority, application Netherlands, Sep. 3, 1976, 7609815

Int. Cl.[2] **H01L** *21/306*

U.S. Cl. 156—643 **6 Claims**



1. A method of manufacturing semiconductor devices, each comprising a semiconductor body having a desired structure, which comprises the steps of:

providing a disc of monocrystalline semiconductor material having a major surface;

forming a plurality of said desired structures in said major surface;

scribing the major surface of the semiconductor disc by laser beam cutting to form grooves between adjacent desired structures, the major surface of the monocrystalline semiconductor disc becoming polluted with particles of nonmonocrystalline semiconductor material during said laser beam cutting;

selectively removing said polluting particles from the major surface of the semiconductor disc by preferentially chemically etching the nonmonocrystalline semiconductor material of the particles with respect to the monocrystalline semiconductor material of the disc; and

severing the semiconductor disc by breaking along the scribed grooves to separate the disc into said semiconductor devices.

4,224,102

REMOVAL OF BITUMEN FROM WASTE PAPER

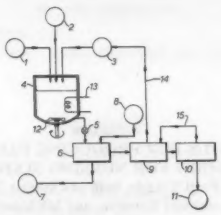
Heikki Mamers, Seaford, and David N. J. Menz, Edithvale, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Jul. 27, 1978, Ser. No. 928,333

Claims priority, application Australia, Jul. 27, 1977, 0997/77

Int. Cl.[3] **D21B** *1/32*

U.S. Cl. 162—5 **9 Claims**



1. A method for removing bitumen from bitumen-containing reslushed wastepaper stock, which method comprises the steps of (i) agitating the stock in water in the presence of a solid hydrophobic material and a surface active agent at a temperature at or above the softening point of the bitumen, (ii) ceasing the agitation, (iii) lowering the temperature of the mixture below the softening point of the bitumen thus causing the bitumen to adhere to said hydrophobic material, and (iv) separating the thus produced bitumen-associated hydrophobic material from the wastepaper stock.

4,224,103

BONDING COMPOSITION FOR INCOMBUSTIBLE FIBROUS MATERIALS

Hideo Yamaguchi, Naruto; Masahiro Kobayashi, Tokushima; Atsunobu Mizote, Nara, and Yoshiyuki Iwamuro, Kyoto, all of Japan, assignors to Otsuka Chemical Co. Ltd. and Sansho Co., Ltd., both of Osaka, Japan

Filed Jun. 27, 1979, Ser. No. 52,597

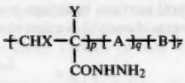
Claims priority, application Japan, Jul. 7, 1978, 53-83239

Int. Cl.[2] **D21H** *1/10;* **B05D** *3/02*

U.S. Cl. 162—135 **5 Claims**

1. A process for preparing incombustible sheet materials which comprises forming a sheet from an aqueous dispersion of an incombustible fibrous material and, prior to or subsequently to the formation of the sheet, contacting the incombustible fibrous material with a bonding composition comprising (a) a

water-soluble polymer containing hydrazide groups of the following general formula:



wherein X is hydrogen atom or carboxyl group, Y is hydrogen atom or methyl group, A is acrylamide unit, methacrylamide unit, an acrylate unit, a methacrylate unit or maleic anhydride unit, B is a unit derived from a monomer copolymerizable with acrylamide, methacrylamide, an acrylate, a methacrylate or maleic anhydride, and there is the following relationship among p, q and r:

$p+q+r=100\%$ by mole

$20\% \text{ by mole} \leqq p \leqq 100\%$ by mole

$0\% \text{ by mole} \leqq q+r \leqq 80\%$ by mole

or its adduct with a water-soluble alkaline earth metal salt of an inorganic acid, in the presence of (b) a heavy metal ion of a heavy metal selected from the group consisting of copper, cobalt, lead, zinc, iron, tin, mercury, nickel, cadmium and manganese to chelate said polymer or its adduct; said polymer containing hydrazide groups or its adduct and said heavy metal ion being employed in amounts of 1% to 30% by weight and 0.0001% to 2% by weight, respectively, based on the weight of said incombustible fibrous material.

3. The process of claim 1, wherein a sheet material containing said heavy metal ion is formed, and said water-soluble polymer or its adduct is impregnated into the sheet.

4,224,104

PAPER MANUFACTURING STRUCTURE PARTICULARLY FOR DETACHING A WEB FROM A WIRE

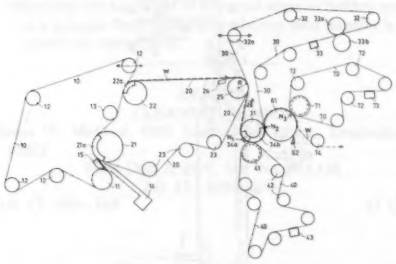
Matti Kankaanpiää, Espoo, Finland, assignor to Valmet Oy, Finland

Continuation-in-part of Ser. No. 787,334, Apr. 14, 1977, Pat. No. 4,113,557. This application Jul. 7, 1978, Ser. No. 922,800

Claims priority, application Finland, Apr. 14, 1976, 761031; Oct. 11, 1977, 772990

Int. Cl.[2] D21F *2/00, 3/10*

U.S. Cl. 162—205 **9 Claims**



5. A method for operating a paper manufacturing machine wherein a web is detached from a forming wire loop and conducted to a press section of the machine by a transfer felt, comprising the steps of:

conducting the web carrying forming wire into engagement with a first sector of a detachment transfer roll situated inside said wire loop over which the direction of travel of the web substantially changes;

conducting the transfer felt in a relatively dry condition into engagement with the web over a second sector within said first sector of the detachment transfer roll, said transfer felt also functioning as a pressing felt partially operating in at least one of the press nips in the press section;

detaching said web from said forming wire and transferring it to said felt under the relatively prolonged action of centrifugal force acting on the web by virtue of the change of direction of the web over at least a portion of the first sector of the detachment transfer roll and simultaneous adhesion forces causing said web to adhere to the outer side of the felt; and

transporting the web on the transfer felt to the first dewatering press nip of the press section by moving the web carrying felt downwardly in a substantially vertical direction to the first press nip.

4,224,105

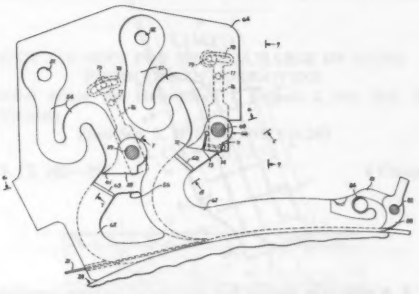
APPARATUS FOR SIMULTANEOUSLY COVERING EACH OF A PLURALITY OF ELONGATED MATERIALS WITH UNIFORMLY WEIGHTED PULP INSULATION

Brian Lynch, Norcross, and James G. Wright, Jr., Roswell, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Division of Ser. No. 892,344, Mar. 31, 1978. This application Mar. 2, 1979, Ser. No. 16,689

Int. Cl.[2] D21H *1/00*

U.S. Cl. 162—268 **4 Claims**



1. An apparatus for supplying a pulpous mixture to a plurality of electrical conductors to form pulp insulation thereon which is uniform in weight among the conductors, which comprises;

a vacuum-forming surface;

means for advancing a plurality of conductors into engagement with said vacuum-forming surface;

a headbox adjacent said conductors and said vacuum-forming surface, said headbox comprising;

(A) a first zone, said first zone comprising:

a first channel for conveying a pulpous mixture;

means for supplying a pulpous mixture through said channel;

means for dividing the pulpous mixture flowing in said channel into a plurality of individual streams, each of said streams associated with one of said conductors, said dividing means causing a ribbon of pulpous material to be formed on said vacuum forming surface under each conductor; and

means common to in said first zone of said headbox for controlling the relative average volumetric flow rate of a pulpous mixture; and

(B) a second zone, said second zone comprising:

a second channel for conveying a pulpous mixture;

means for supplying the pulpous mixture to said channel associated with the second zone;

means for dividing the pulpous mixture flowing in said second channel into a plurality of individual streams, each said streams being associated with one of said conductors and one of said streams in said first zone, said dividing means causing a ribbon of pulpous mate-

rial to be formed over each of said conductors on said vacuum forming surface; and

adjustable control means for trimming the relative average volumetric flow rate of the pulpous mixture in the individual streams of said second zone such that the final ribbon weights are substantially uniform among all the conductors.

4,224,106

PLATE-TYPE NUCLEAR FUEL ELEMENT

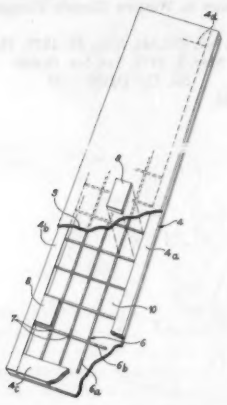
Jacques Delafosse, Gif-sur-Yvette, France, assignor to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 13, 1978, Ser. No. 924,413

Claims priority, application France, Jul. 22, 1977, 77 22541

Int. Cl.[2] G21C *3/18*

U.S. Cl. 176—75 **6 Claims**



1. A plate-type nuclear fuel element of the type comprising a fuel core constituted by a plurality of ceramic fuel wafers fitted in juxtaposed relation within a frame, each fuel wafer being provided with a metallic protective covering and placed between two metallic cladding plates, wherein a lateral covering is provided for each fuel wafer by means of a grid of thin wires fitted within the frame and each mesh of said grid has the shape and dimensions of a fuel wafer in order to serve as a housing for one of said wafers.

4,224,107

SPACER GRIDS FOR A NUCLEAR REACTOR FUEL ASSEMBLY

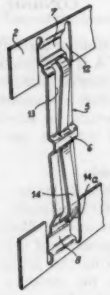
Jacques Delafosse, Gif-sur-Yvette, and Claude Feutrel, Vauhallan, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 757,566, Jan. 7, 1977, abandoned. This application May 9, 1978, Ser. No. 904,452

Int. Cl.[2] G21C *3/30*

U.S. Cl. 176—78 **2 Claims**

1. An improvement in spacer grids for nuclear reactor fuel assemblies having an open structure of an array of flat sheet metal members in interfitting relation and defining compartments, narrow corrugated strips having a long direction projecting into the interior of said compartments and forming separations between openings of substantial width in the surface of said sheet metal members, spaced bosses in said sheet metal members adjacent said strips and also in said strips and an outer frame surrounding said structure, the improvement comprising said sheet metal members being joined to said corrugated strips with greater flexibility of said sheet metal members to increase the non-linear deflection of said strips in respect of the same applied force, said sheet metal members further including spaced slits at the junction with and one on each side of and parallel to said long direction of said corrugated strips whereby to torsion applied to said sheet metal members is added to the deflection of said strips, each of said corrugated strips having a central portion, openings in each of said strips extending away from said central portion towards the adjacent



one of said sheet metal members, a bearing-arm extending from said raised central portion over each of said openings toward the adjacent one of said sheet metal members forming two bearing-arms for each of said strips, said bearing-arms having relative elasticity with respect to said strips.

4,224,108

DECOKING APPARATUS

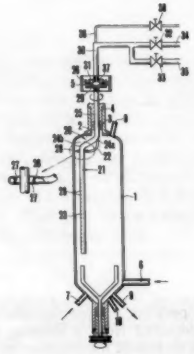
Hisao Takahashi, Yokohama; Takeshi Nomura, Tokyo; Kiyoji Ozaki; Haruo Izumida, both of Yokohama; Naotaka Miwa, Ichihara; Naoshi Kawabe, Ichihara; Masatomo Shigeta, Ichihara; Hiroshi Hozuma, Ichihara, and Seiichi Suzuki, Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Nihonbashi, Japan

Filed Feb. 3, 1978, Ser. No. 874,946

Claims priority, application Japan, Feb. 4, 1977, 52-11555[U]

Int. Cl.[2] C10G *9/12*

U.S. Cl. 196—122 **5 Claims**



1. A decoking apparatus for use on a reaction vessel for the thermal cracking of heavy petroleum oils, including

(A) an injection pipe assembly comprising:

(1) a rotatable main injection pipe inserted into the reaction vessel and having a vertical straight leg portion extending along the inner wall of the reaction vessel in close proximity thereto, said straight leg portion being provided along the length thereof with a plurality of jets for spraying heavy petroleum oil against the inner wall; and

(2) an auxiliary injection pipe rotatable with said main injection pipe extending into the reaction vessel and terminating at a position maintained over said vertical straight leg portion of said main injection pipe for injecting a scrubbing liquid over said main injection pipe to wet the outer surface of said vertical straight leg portion; and

(B) means for rotating said injection pipe assembly.

4,224,109

PROCESS AND APPARATUS FOR THE RECOVERY OF WASTE HEAT FROM A COKE OVEN OPERATION

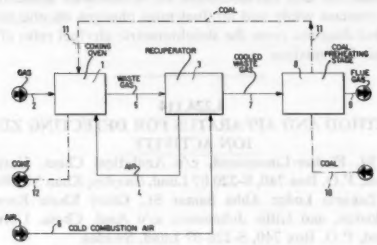
Claus Flockenhaus, Essen, Fed. Rep. of Germany, assignor to Bergwerksverband GmbH and Didier Engineering GmbH, both of Essen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 894,019, Apr. 5, 1978, abandoned. This application Jul. 24, 1978, Ser. No. 927,538

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1977, 2715536

Int. Cl.² C10B *5/20*

U.S. Cl. 201—41 **21 Claims**



1. A process for the recovery of waste heat from a coke oven operation, comprising:

cooling waste gas in a first stage to not less than about 400° C. in a recuperator of the oven having waste gas channels of a cross-section of about 0.05 to 0.15 m^2 and air channels of a cross-section of at most about 0.01 m^2 so as to principally achieve heat transfer due to radiation of the waste gas; and

subjecting the waste gas in a second stage to further cooling in a separate heat exchanger wherein heat transfer is principally by convection.

4,224,110

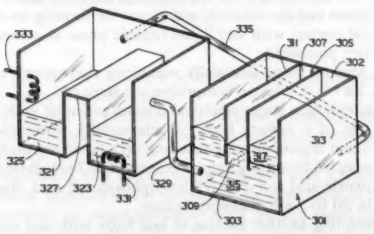
CLEANING DEVICE

James W. McCord, 9101 Nottingham Pkwy., Louisville, Ky. 40222

Filed Dec. 5, 1977, Ser. No. 857,116

Int. Cl.² B08B *7/04*

U.S. Cl. 202—169 **11 Claims**



1. A cleaning device consisting essentially of:

a housing having an open top and a closed bottom for receiving a liquid solution containing at least two components therein, the first component being immiscible with and denser than a second component;

a chamber having an open top and an opening in the bottom stationarily mounted within the housing with sides of the chamber terminating at the upper extremity above the second component and the lower extremity below the liquid level of the first component; and,

means for cleaning or finishing objects mounted within said housing.

9. The cleaning device of claim 1 including a purification means for said first component, said purification means including a container with two sub-chambers therein, said sub-chambers being separated by a wall of preselected height, said container being connected to said housing by a conduit means, said conduit means being in flow communication with one of said sub-chambers and the first solvent layer of said housing, said one of said sub-chambers having heat emitting means disposed therein and said other of said sub-chambers having condensing means therein, said condensing means being disposed at a preselected position above said wall of preselected height, said other of said sub-chambers incuding an opening therein in communication with a second conduit, said second conduit being in flow communication with an opening in said housing.

4,224,111

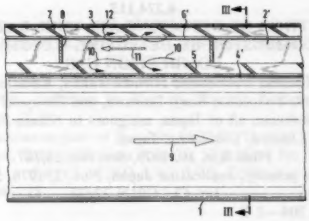
EXIT AIR DUCT FOR THE DISCHARGE OF GASES PRODUCED IN COKE-OVENS

Günther Rozas, Am Hasenbusch 7, Erkrath 1, Fed. Rep. of Germany

Filed Sep. 5, 1978, Ser. No. 939,350

Int. Cl.² C10B *27/06*

U.S. Cl. 202—255 **4 Claims**



1. Duct means for the discharge of gases produced in coke-ovens comprising a collection duct defining a longitudinally extending slot in its upper wall; a box-like superstructure having generally opposed side walls and both an open top and an open bottom, the superstructure extending along the length of and parallel to the collection duct and the bottoms of the side walls of the superstructure being connected thereto along opposite sides of the slot, a flexible cover belt on said superstructure, the tops of the side walls of the superstructure supporting the flexible cover belt, the top of the superstructure being sealed off through engagement of said side walls with said flexible cover belt, which cover belt can be locally lifted off to allow admission of said gases, upper grate means located in the top portion of the superstructure and consisting of spaced-apart grate plates extending transversely to the collection duct and inclined away from said belt in the direction of the gas flow in said collection duct, lower grate means located in the bottom portion of the superstructure and consisting of spaced-apart screen plates extending transversely to the collection duct and inclined away from said belt in the direction of the gas flow, said upper and lower grate means defining an air duct therebetween and functioning to generate transient counter-current circulating flows of said gases with a portion of the circulating flow generated by said screen plates creating a relatively low speed flow between said upper and lower grate means in a direction opposite to said collection duct gas flow,

and transverse partitions extending across said superstructure subdividing said air duct into air chambers, the volume of each air chamber being such that the flow of hot gases into said air duct from the collection duct is greatly reduced and such that the portion of the heat absorbed at the lower grate is transferred to said gases and air flowing into said air duct without excessively heating up said cover belt.

4,224,112

RECOVERY OF 1,1-DIHYDROHEPTAFLUOROBUTANOL FROM WATER BY DISTILLATION

William V. Childs, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 867,078, Jan. 5, 1978, Pat. No. 4,156,791, which is a continuation of Ser. No. 695,217, Jun. 11, 1976, abandoned. This application Dec. 21, 1978, Ser. No. 972,109

Int. Cl.[2] **B01D** *3/36;* **C07C** *31/34*

U.S. Cl. 203—18 **5 Claims**

4. A process for removing water from a mixture comprising water and 1,1-dihydroheptafluorobutanol which comprises the steps of:

(a) distilling said mixture comprising water and 1,1-dihydroheptafluorobutanol to produce an overhead water/1,1-dihydroheptafluorobutanol azeotrope.

(b) condensing said azeotrope,

(c) cooling said condensed azeotrope, thereby effecting a phase separation into a light predominantly aqueous liquid phase, and a heavy predominantly organic liquid phase, and

(d) returning said heavy predominantly organic liquid phase to said step (a) until the water content in the original mixture of said step (a) is substantially exhausted.

4,224,113

METHOD OF DETECTING AIR/FUEL RATIO IN COMBUSTOR BY DETECTING OXYGEN IN COMBUSTION GAS

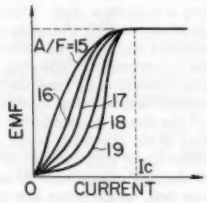
Shinji Kimura, Yokohama; Hiroshi Takao, Kamakura; Shigeo Ishitani, Yokosuka; Kenji Ikezawa, and Hiroyuki Aoki, both of Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 10, 1979, Ser. No. 28,747

Claims priority, application Japan, Nov. 2, 1978, 53-135296

Int. Cl.[2] **G01N** *27/58*

U.S. Cl. 204—1 T **8 Claims**



1. A method of detecting an air/fuel ratio of an air-fuel mixture subjected to combustion in an apparatus having a combustion chamber and an exhaust conduit through which passes a combustion gas produced by combustion of the air-fuel mixture, the method comprising the steps of:

disposing an oxygen sensing probe in said exhaust conduit so as to be contacted with said combustion gas, said probe comprising a gas permeably porous layer of an oxygen ion conductive solid electrolyte, a gas permeably porous and electronically conductive reference electrode layer formed on and in intimate contact with one side of the solid electrolyte layer, a gas permeably porous and electronically conductive measurement electrode layer formed on and in intimate contact with the other side of said solid electrolyte layer and a shield layer which is made of an electrochemically inactive material and covers said reference electrode layer such that said reference electrode layer communicates with an environmental gas atmosphere only through pores in said measurement electrode layer and said solid electrolyte layer;

applying continuously a DC voltage to said reference and measurement electrode layers so as to keep a DC current of a predetermined intensity flowing through said solid electrolyte layer between said reference electrode layer and said measurement electrode layer thereby to maintain a reference oxygen partial pressure at the interface between said reference electrode layer and said solid electrolyte layer; and

measuring an electromotive force generated across said reference electrode layer and said measurement electrode layer thereby to detect said air/fuel ratio based on a predetermined relationship between said air/fuel ratio and the magnitude of said electromotive force;

said predetermined intensity of said current being smaller than a critical current intensity above which the magnitude of said electromotive force becomes substantially constant while said air/fuel ratio changes on one side of but does not cross the stoichiometric air/fuel ratio of said air-fuel mixture.

4,224,114

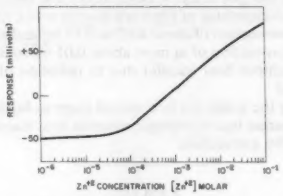
METHOD AND APPARATUS FOR DETECTING ZINC ION ACTIVITY

Ulla M. Fiedler-Linnersund, c/o Analytical Chem. Univ. of Lund, P.O. Box 740, S-220 07 Lund, Sweden; Khan M. Bhatti, 4, Zakaria Lodge Abba Samar St., Ghari Khata Karachi, Pakistan, and Gillis Johansson, c/o Anal. Chem. Univ. of Lund, P.O. Box 740, S-220 07 Lund, Sweden

Filed May 24, 1979, Ser. No. 41,743

Int. Cl.[3] **G01N** *27/30, 27/46*

U.S. Cl. 204—1 T **4 Claims**



1. An electrode preferentially sensitive to the activity of zinc ions, Zn^{+2}, in solution comprising:

a liquid organic phase containing (a) a liquid ion-exchanger selected from the group consisting of di-2-ethylhexylphosphoric acid and di-octylphenylphosphoric acid, dissolved in (b) tri-2-ethylhexylphosphate;

means for so containing the liquid organic phase as to provide an interface for ion exchange between said organic phase and the solution; and means for forming an electrical contact with said liquid organic phase at a fixed contact potential.

2. Method of preferentially measuring the activity of zinc ions, Zn^{+2}, in solution comprising the steps of:

establishing a stable electrical contact potential with a portion of a unitary body of substantially water-insoluble liquid organic phase containing (a) a liquid ion-exchanger selected from the group consisting of di-2-ethylhexylphosphoric acid and di-octylphenylphosphoric acid, dissolved in (b) tri-2-ethylhexylphosphate;

contacting another portion of said body with said solution; and

detecting the potential arising across the interface between said body and said solution.

3. An electrode preferentially sensitive to the activity of zinc ions, Zn^{+2}, in solution comprising:

a liquid organic phase containing (a) a liquid ion-exchanger selected from the group consisting of di-2-ethylhexylphosphoric acid and di-octylphenylphosphoric acid, dissolved in (b) tri-n-octylphosphate;

means for so containing the liquid organic phase as to provide an interface for ion exchange between said organic phase and the solution; and

means for forming an electrical contact with said liquid organic phase at a fixed contact potential.

4. Method of preferentially measuring the activity of zinc ions, Zn^{+2}, in solution comprising the steps of:

establishing a stable electrical contact potential with a portion of a unitary body of substantially water-insoluble liquid organic phase containing (a) a liquid ion-exchanger selected from the group consisting of di-2-ethylhexylphosphoric acid and di-octylphenylphosphoric acid, dissolved in (b) tri-n-octylphosphate;

contacting another portion of said body with said solution; and

detecting the potential arising across the interface between said body and said solution.

4,224,115

PROCESS FOR FORMING ELECTRODE ON SEMICONDUCTOR DEVICE

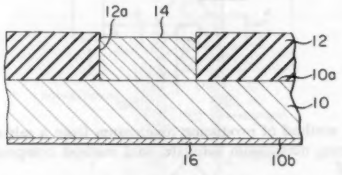
Aiichiro Nara; Hisao Kondo; Takeji Fujiwara, and Hideaki Ikegawa, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 745,913, Nov. 29, 1976, abandoned. This application Jun. 26, 1978, Ser. No. 919,308

Claims priority, application Japan, Dec. 3, 1975, 50-144169

Int. Cl.[2] C25D *5/02, 7/12;* **H01L** *29/46*

U.S. Cl. 204—15 **3 Claims**



1. A process for forming a Schottky barrier semiconductor device comprising the steps of:

(a) preparing an electroplating solution containing nickel and palladium, the pH of said solution being between 7.8 and 8.5;

(b) contacting said electroplating solution with a semiconductor substrate under electroplating conditions to form electrode of nickel-palladium alloy on said semiconductor, said alloy consisting of 55 to 70 atomic percent nickel and 45 to 30 atomic percent palladium, said alloy and said semiconductor forming a Schottky barrier.

4,224,116

DISPLAY DEVICES

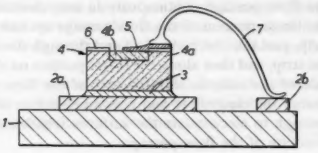
Terence F. Knibb, and Richard G. O'Rourke, both of Northampton, England, assignors to Plessey Handel und Investments AG, Zug, Switzerland

Continuation-in-part of Ser. No. 869,151, Jan. 13, 1978. This application Apr. 13, 1979, Ser. No. 29,878

Claims priority, application United Kingdom, Jan. 17, 1977, 1756/77

Int. Cl.[3] C25D *5/02, 7/06*

U.S. Cl. 204—15 **17 Claims**



1. A method of making a display device including the steps of:

bonding a plurality of metallic electrical connections onto a substrate,

bonding a light emitting diode chip to said substrate,

connecting a number of said plurality of metallic electrical connections to said light emitting diode chip, and

electroplating at least some of said metallic electrical connections with a layer of light absorbing material, each said layer of light absorbing material comprising a metallic material having a black color.

4,224,117

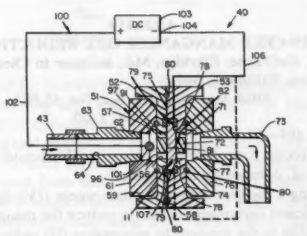
METHODS OF AND APPARATUS FOR SELECTIVE PLATING

Monty J. Edwards, Chamblee, and James E. Voytko, Doraville, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 865,569, Dec. 29, 1977, abandoned. This application Apr. 18, 1979, Ser. No. 30,985

Int. Cl.[2] C25D *5/02, 5/08, 7/06*

U.S. Cl. 204—15 **12 Claims**



1. A method of plating selected areas of surfaces of a strip, which comprises the steps of:

continuously advancing a strip along a path, said strip having two major surfaces and having openings which extend between said major surfaces;

cathodically charging the strip;

masking longitudinally extending portions of the strip along a portion of the path to expose selected areas of surfaces of the strip including at least those surfaces which define the openings;

establishing a substantially enclosed flow passage having an entry end and an exit end for facilitating movement of an

electroplating electrolyte from a source into engagement with the exposed areas of the strip along said portion of the path and through the openings in the strip, said flow passage including linear portions extending normal to the strip for a substantial distance from each major surface thereof;

positioning a continuously charged anode in a linear portion of the flow passage adjacent at least one major surface of and extending parallel to the strip along said portion of the path, said anode being focused on the exposed areas of the strip; and

flowing all of the electrolyte which enters the entry end of the flow passage continuously in one direction through the linear portion of the flow passage on one side of the strip, past the charged anode and through the openings in the strip, and then along the linear portion on the opposite side of the strip to the exit end of the flow passage to charge the electrolyte and pass an electric current therethrough to electroplate the surfaces which extend in the direction of the flow passage.

4,224,118

METHOD OF MASKING PLATED ARTICLE WITH A POLY(ISOBUTYL METHACRYLATE) AND POLY(VINYL TOLUENE) CONTAINING COATING

Kenneth H. Hans, Alexandria, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 4, 1979, Ser. No. 72,052
Int. Cl.³ C25D *5/02*
U.S. Cl. 204—15 **1 Claim**

1. In a method of electrolytically depositing a metal coating onto selected surface portions of an electroplatable metal or polymer substrate comprising the steps of

shielding surface portions of the substrate to be electrolytically coated;

applying a polymeric coating layer to surface portions of the substrate exposed by the shielding; and

subjecting the substrate to electrolytic deposition such that a layer of metal is deposited on surface portions not covered by the polymeric coating layer;

the improvement wherein the polymeric coating layer comprises a mixture of fused poly(isobutyl methacrylate) resin and poly(vinyl toluene) resin.

4,224,119

IN-CELL MANGANESE ORE REDUCTION

Denis F. DeCraene, Elkridge, Md., assignor to Chemetals Corporation, Baltimore, Md.

Filed Aug. 10, 1979, Ser. No. 65,503
Int. Cl.² C25C *3/00*
U.S. Cl. 204—64 R **10 Claims**

1. A process for reducing manganese (IV) dioxide to manganese metal, comprising the steps of:

blending a mixture containing manganese (IV) dioxide with sufficient carbonaceous fuel to reduce the manganese (IV) dioxide in the mixture to manganese (II) oxide,

drying said blended mixture of manganese (IV) dioxide and carbonaceous fuel to remove free moisture,

grinding said blended, dried mixture of manganese (IV) dioxide and carbonaceous fuel to a particle size between about −30 mesh to about −100 mesh,

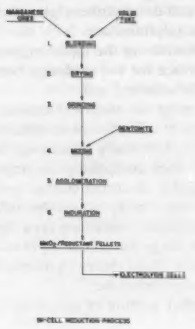
mixing said ground, blended, dried mixture with about 0.25% to about 4% by weight of a binder,

agglomerating said ground, blended, dried, binder-containing mixture to form pellets,

indurating said pellets by heating to a temperature between about 200° F. and about 350° F.,

heating said pellets to reduce said manganese (IV) dioxide to manganese (II) oxide with said carbonaceous fuel,

dissolving said manganese (II) oxide in a fused salt electrolytic bath,



passing an electric current through said electrolytic bath containing dissolved manganese (II) oxide to reduce said manganese (II) oxide to manganese metal, and

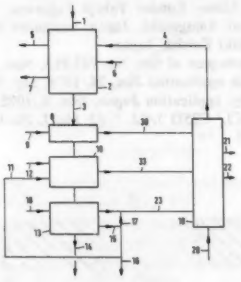
recovering said manganese metal.

4,224,120

ELECTROLYTIC METHOD AND APPARATUS FOR PRODUCING MAGNESIUM FROM A SALT SOLUTION CONTAINING MAGNESIUM SULPHATE

Werner Riediker, Toronto, Canada, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jul. 25, 1979, Ser. No. 60,370
Claims priority, application Switzerland, Aug. 4, 1978, 8339/78
Int. Cl.² C25C *3/04*
U.S. Cl. 204—70 **4 Claims**



1. A method of producing magnesium from a salt solution containing magnesium sulphate, said method comprising the steps of

adding a calcium chloride solution to the salt solution in a crystallization process containing at least one desulphation stage to separate out calcium sulphate and to obtain at least one of the salts magnesium chloride and carnallite;

thereafter drying and melting the obtained magnesium chloride or carnallite while liberating separate waste gas mixtures containing air, gaseous hydrogen chloride, and carbon dioxide;

thereafter electrolytically separating out magnesium from the obtained magnesium chloride or carnallite while liberating a third gas mixture of chloride gas, air, and carbon dioxide;

continuously washing the third gas mixture with milk of lime

at a pH above 10 in a first absorption stage to obtain a first suspension containing hypochloride ions;

thereafter separating solids from the first suspension in a first separating stage;

decomposing the hyprochlorite ions in the solid-free first suspension to chloride ions in the presence of a catalyst containing at least one of nickel, iron, cobalt and copper within a catalytic reaction stage at a pH above 10;

thereafter separating out the catalyst in a second separating stage and purifying the catalyst in a processing stage for recycling to the reaction stage;

mixing the solution obtained in the second absorption stage with milk of lime and washing the gas mixture obtained from melting the magnesium chloride or carnallite with the obtained mixture at a pH below 3 in a second absorption stage;

thereafter reducing chlorate compounds in the solution to chloride ions in the presence of a reducing agent;

then mixing the solution from the second absorption stage and the solids separated in the first separating stage at a pH below 3 in a third absorption stage to then absorb hydrogen chloride from the waste gas mixture obtained from drying the magnesium chloride or carnallite;

neutralizing the solution obtained in the third absorption stage with milk of lime;

thereafter separating solids from the neutralized solution in a third separating stage to obtain a 30% to 40% calcium chloride solution containing not more than 50 ppm iron ions and not more than 50 ppm chlorate ions; and

finally supplying the calcium chloride solution to the crystallization unit.

4,224,121

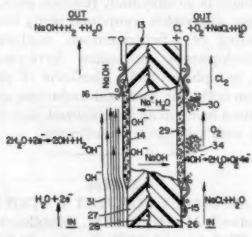
PRODUCTION OF HALOGENS BY ELECTROLYSIS OF ALKALI METAL HALIDES IN AN ELECTROLYSIS CELL HAVING CATALYTIC ELECTRODES BONDED TO THE SURFACE OF A SOLID POLYMER ELECTROLYTE MEMBRANE

Russell M. Dempsey, Hamilton; Thomas G. Coker, Waltham; Anthony B. LaConti, Lynnfield, and Anthony R. Fragala, North Andover, all of Mass., assignors to General Electric Company, Wilmington, Mass.

Continuation-in-part of Ser. No. 892,500, Apr. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 858,959, Dec. 9, 1977, abandoned. This application Jul. 6, 1978, Ser. No. 922,316

Int. Cl.[3] **C25B** *1/46, 9/04, 11/04, 13/08*

U.S. Cl. 204—98 **34 Claims**



1. A process for the continuous production of chlorine by the electrolysis of alkali metal chloride which comprises:

(a) continuously bringing an aqueous alkali metal chloride solution to the anode chamber of an electrolytic cell which is separated from the cathode chamber by a cation selective ion exchange membrane,

(b) bringing the solution into contact with a porous, gas permeable, particulate anode electrode bonded to and embedded in the membrane on the side facing the anode chamber, whereby the catalytic sites in the electrode are in contact with the ion exchanging sites of the membrane so that electrolysis can take place directly at the membrane-electrode interface, said anode being opposite to a porous, gas permeable, particulate cathode bonded to the other side of the membrane.

(c) continuously bringing an aqueous medium selected from the group consisting of water and dilute caustic into the cathode chamber and into contact with the catalytic cathode electrode to provide a source of hydroxyl ions at the cathode and for continuously sweeping the cathode electrodes to dilute caustic formed at the cathode,

(d) supplying current to the electrodes through current collectors in physical contact with the electrodes bonded to the membrane to electrolyze the alkali metal chloride at the anode to produce chlorine and to electrolyze water at the cathode to produce alkali metal hydroxide and hydrogen,

(e) continuously removing chlorine from the anode compartment and alkali metal hydroxide and hydrogen from from the cathode compartment.

4,224,122

RECOVERY OF NON-FERROUS METALS BY THERMAL TREATMENT OF SOLUTIONS CONTAINING NON-FERROUS AND IRON SULPHATES

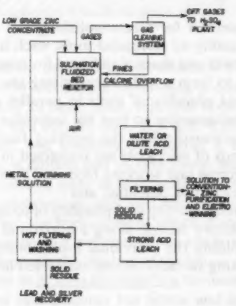
Igor A. E. Wilkomirsky; Roy S. Boorman, and Robert S. Salter, all of Fredericton, Canada, assignors to New Brunswick Research and Productivity Council, Fredericton, Canada

Filed Sep. 11, 1978, Ser. No. 940,937

Claims priority, application Canada, May 5, 1978, 302719

Int. Cl.[2] **C25C** *1/16;* **C01G** *9/06*

U.S. Cl. 204—119 **22 Claims**



1. A method for recovering zinc from a strong sulphuric acid solution containing zinc and iron as sulphates or from zinc sulphide ores or concentrates, comprising:

(a) roasting said sulphate or zinc sulphide ore or concentrate in a subdivided form in a air fluidized bed reactor at a temperature from 600° to 750° C., with 20–150% excess air for an average retention time of 1–12 hours resulting in an atmosphere comprising SO_2, SO_3, water vapor and remaining O_2 and N_2 from the air, to obtain a calcine containing ferrite and sulphates, oxysulphates and oxides of zinc, plus hematite;

(b) leaching said calcine with water or dilute sulphuric acid solution in such a manner that the sulphates, oxysulphates, and oxides of zinc are leached out in part from the calcine into the water or dilute sulphuric acid solution;

(c) subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution suitable for purification-metal recovery steps for zinc;

(d) leaching the solid residue resulting from step (c) with strong sulphuric acid solution in such a manner that the ferrite and unreacted sulphides of zinc are converted to the sulphates of iron and zinc;

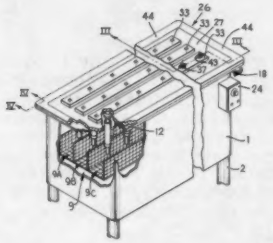
(e) subjecting the pulp resulting from step (d) to a liquid-solid separation step to obtain a leach solution containing said sulphates of iron and zinc; and

(f) recycling a said solution obtained in step (e) into said fluidized bed reactor in a subdivided form to convert the sulphates of iron to ferric oxide, SO_2 and SO_3 and sulphuric acid to SO_2, SO_3 and gaseous H_2O.

4,224,123
METHOD AND APPARATUS FOR ELECTROPOLISHING TABLET COMPRESSING TOOLINGS

Donald E. McLain, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Jan. 15, 1979, Ser. No. 3,387
Int. Cl.[2] C25F *3/16, 7/00*; C25D *17/28*
U.S. Cl. 204—129.55 **11 Claims**



10. In a method for electropolishing the working face of each of a plurality of elongated tools, each having a working face at the lower end thereof and used for compressing medicinal powders to form a tablet, comprising the steps of:

holding said plurality of tools in parallel and horizontally spaced relationship so that the individual tools are vertically positioned while the working faces located at the lower ends of said tools are immersed in an electrolyte;

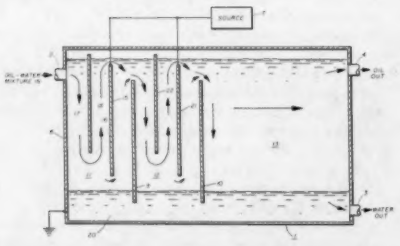
imposing across said working faces and through said electrolyte an electrical potential; and

simultaneously moving said plurality of tools with a horizontal translatory motion along a horizontal looplike pattern while holding the individual tools nonrotatable but with the working surfaces thereof immersed in said electrolyte.

4,224,124
ELECTROSTATIC COALESCING SYSTEM

Kenneth E. Pope, Tulsa, Okla., assignor to Combustion Engineering, Inc., Windsor, Conn.

Division of Ser. No. 929,045, Jul. 28, 1979. This application Aug. 30, 1979, Ser. No. 71,154
Int. Cl.[2] B03C *5/00*
U.S. Cl. 204—186 **2 Claims**



1. A method of separating the fluids of a mixture wherein the fluid finely dispersed within the mixture is significantly more polar than the other fluids of the mixture, including,

establishing an electrostatic field between a driven electrode and second electrode by connection of the electrodes to a source of electrical potential,

physically and electrically dividing the electrostatic field into two sections by an electrode body between the driven and second electrodes,

initially flowing the mixture of fluids to be separated between the second electrode and the floating electrode, wherein this first portion of the electrostatic field coalesces polar fluid in the mixture and gravitates a first quantity into separation from the mixture,

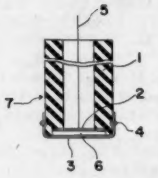
passing the remaining mixture of fluids containing a quantity of uncoalesced polar fluid drops through the second section of the field between the floating electrode and driven electrode, wherein additional polar fluid is coalesced and gravitated into separation from the mixture, and

passing the remaining mixture of fluids out of the electrostatic field in separation from the coalesced and gravitated polar fluids.

4,224,125
ENZYME ELECTRODE

Kenichi Nakamura, Hirakata; Shiro Nankai, Neyagawa; Takashi Iijima, Hirakata, and Masataro Fukuda, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 26, 1978, Ser. No. 946,527
Claims priority, application Japan, Sep. 28, 1977, 52/117069
Int. Cl.[2] G01N *31/14*
U.S. Cl. 204—195 B **10 Claims**



1. An enzyme electrode which at least comprises an oxidoreductase enzyme, an artificial redox compound acting as an electron mediator in an enzymatic reaction associated with said oxidoreductase, said redox compound being selected from the group consisting of p-benzoquinone, methylene blue, 2,6-dichlorophenolindophenol, potassium ferricyanide, thionine, gallocyanine, indophenol and a riboflavin -5'-phosphate ester, and an electron collector, said oxidoreductase enzyme and said redox compound being in an immobilized state in juxtaposition or in contact with said electron collector.

4,224,126
ANODE ASSEMBLY FOR HOT WATER HEATERS

Arthur W. Bidwell, 211 Highland St., Middletown, Ohio 45052

Filed Apr. 12, 1979, Ser. No. 29,385
Int. Cl.[3] C23F *13/00*
U.S. Cl. 204—197 **17 Claims**

1. An anode assembly for hot water heaters, comprising:

(a) a cap-shaped plug having a central substantially flat section, and an externally and internally threaded depending cylindrical section,

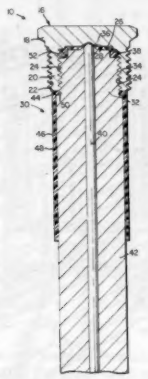
(b) an elongated anode made of magnesium and having a central longitudinally extending core wire,

(c) the anode having a threaded upper section dimensioned to fit within and threadedly engage the internal threads of the depending cylindrical section of the plug,

(d) the top surface of the anode and the internal surface of

the flat section of the plug each having one of two centrally disposed shaped, mutually engageable portions which are pressed into firm interengagement to provide good mechanical interlock and good electrical continuity,

(e) the lower surface of the threads of the plug and the upper



surface of the threads of the anode being drawn into firm direct contact with each other while creating a spiral cavity between the other adjacent teeth surfaces, and

(f) thermosetting low viscosity sealant disposed within the spiral cavity and completely filling it to provide a solid continuous watertight area.

4,224,127

ELECTROLYTIC REDUCTION CELL WITH COMPENSATING COMPONENTS IN ITS MAGNETIC FIELD

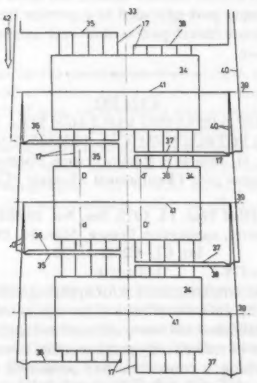
Wolfgang Schmidt-Hatting, Chippis, Switzerland, assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Jul. 26, 1979, Ser. No. 60,922

Claims priority, application Switzerland, Aug. 4, 1978, 8356/78

Int. Cl.[2] C25C *3/16*

U.S. Cl. 204—243 M **4 Claims**



1. In an aluminum potline for the production of aluminum by fused salt electrolysis including a plurality of electrolytic cells arranged in series relationship in at least two rows, each of said cells having a longitudinal axis, wherein electrical current is passed from the cathode bars from one cell to the anode beam of the next cell via a plurality of busbars, the improvement comprising:

at least four asymmetrical busbars for leading the current off in opposite directions, at least two of said busbars being at one side of cell at a first and second distance from the longitudinal axis of said cell and at least the other two of said busbars being on the other side of said cell at a first and second distance from the longitudinal axis of said cell whereby said first distance is greater than said second distance and the busbars at said first distance and said second distance are diametrically opposite each other and the displacement of said busbars are such that a magnetic field is produce in the cell which opposes the magnetic interference induced by the neighboring row of cells.

4,224,128

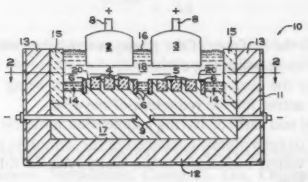
CATHODE ASSEMBLY FOR ELECTROLYTIC ALUMINUM REDUCTION CELL

Richard J. Walton, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Aug. 17, 1979, Ser. No. 67,598

Int. Cl.[2] C25C *3/08*

U.S. Cl. 204—243 R **14 Claims**



1. In an electrolytic cell for the production of metal by electrolysis of molten electrolyte containing a compound of the metal comprising an outer shell, side and bottom walls, a floor supported by said bottom wall, said side walls and floor defining a chamber, said chamber containing a lower zone adapted to contain a molten pad of said metal and an upper zone adapted to contain a body of said molten electrolyte, and at least one anode disposed at least partially within the upper zone of said chamber, the improvement which comprises cathode assembly comprising a pedestal of an electroconductive material disposed beneath the shadow of the anode and extending for the cell floor to at least the interface between the upper and lower zones of said chamber but below and spaced from the underside of said anode, said pedestal having embedded therein and in the face thereof opposite the anode at least one refractory hard metal element, said element being embedded in said pedestal to a depth of at least about 75 percent of its length.

4,224,129

NOVEL OXYGEN ELECTRODE

James A. McIntyre, and Robert F. Phillips, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 2, 1978, Ser. No. 882,834

Int. Cl.[2] C25B *11/03, 11/08, 15/08, 9/00*

U.S. Cl. 204—263 **19 Claims**

1. An improved electrolytic cell for the electrolysis of an aqueous brine solution wherein the cell comprises:

(a) An anode compartment having an anode, an anolyte inlet and an anolyte outlet;

(b) a cathode compartment having a cathode, catholyte inlet and a catholyte outlet;

(c) a membrane or diaphragm separating the anode compartment from the cathode compartment;

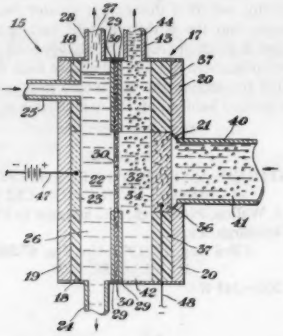
(d) means for intimately mixing and interdispersing an oxy-

gen-bearing gas within a catholyte, prior to introducing the gas-catholyte mixture into the cell;

(e) means for forwarding the oxygen-bearing catholyte through the catholyte inlet to a surface of the cathode;

wherein said cathode comprises:

(1) a porous electroconductive body having a plurality of interstitial passageways therethrough;



(2) the surfaces of the passageways being wettable by the oxygen-bearing catholyte;

(3) the surfaces of the passageways being catalytically active for the reduction of oxygen;

(4) said cathode having a dimension sufficient to allow the oxygen atoms, contained in the catholyte to react with water, contained in the catholyte, to form hydroxyl ions.

4,224,130

ELECTROLYTIC DIAPHRAGM CELL

Carlos M. Moreno, and Robert D. Bridges, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 777,868, Mar. 15, 1977, abandoned. This application Feb. 13, 1978, Ser. No. 877,060

Int. Cl.[2] C25B *13/02, 13/08, 1/16, 1/26*

U.S. Cl. 204—266 **12 Claims**

1. An electrolytic cell for producing chlorine and an alkali metal hydroxide from an alkali metal chloride comprising:

an anode compartment adapted to contain an anolyte containing an alkali metal chloride;

a cathode compartment adapted to contain a catholyte containing an alkali metal hydroxide;

an anode positioned in said anode compartment;

a cathode positioned in said cathode compartment and spaced apart from said anode by a diaphragm;

a porous polytetrafluoroethylene diaphragm with a thickness of from about 5 to about 100 mils, an average pore size of from about 0.1 to about 100 microns, a gas permeability of from about 1 to about 50 seconds, a liquid permeability factor of from about 1 to about 60, and a tensile strength of from about 100 to about 1000 pounds per square inch;

a means to feed the anolyte to said anode compartment;

a means to remove the chlorine from said anode compartment;

a means to remove the alkali metal hydroxide from said cathode compartment;

and a means to supply electrical energy to said anode and said cathode.

4,224,131

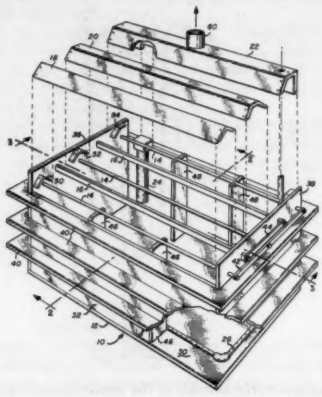
VENTILATED ELECTROPLATING TANK

Steve A. Acero, 21089 Lavina Ct., Cupertino, Calif. 95014, and Edward L. Rougeau, 2592 Glade, Santa Clara, Calif. 95051

Filed Sep. 7, 1979, Ser. No. 73,216

Int. Cl.[2] C25C *7/00, 7/06*

U.S. Cl. 204—274 **12 Claims**



1. A ventilated electroplating tank for containing caustic liquids, comprising:

bottom and wall means forming a container which is open at the top;

first, second and third anode means disposed in parallel relationship to each other and extending across the top of said container;

first and second cathode means disposed in parallel relationship to each other and extending across the top of said container, said first cathode means being positioned between said first and second anode means, and said second cathode means being positioned between said second and third anode means;

hood means disposed across the top of said container so as to provide partial closure thereof, and defining a first opening over said first cathode means and a second opening over said second cathode means, said hood means having a ventilating port provided in a portion thereof through which gases developed within said container may be withdrawn.

4,224,132

DEVICE FOR APPLYING VOLTAGE TO A PART FOR ELECTROCHEMICAL TREATMENT

Alain Gernez, St. Jean de la Ruelle, France, assignor to Compagnie Europeenne pour l'Equipement Menager "Cepem", Paris, France

Filed Mar. 14, 1979, Ser. No. 20,581

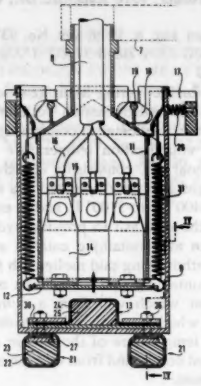
Claims priority, application France, Mar. 31, 1978, 78 09497

Int. Cl.[2] C25D *17/00*

U.S. Cl. 204—279 **11 Claims**

1. A current supplying device for applying voltage to a part to be treated by an electrochemical process in which physical contact is established between said current supplying device and the part to be treated only at the moment of treatment, said device comprising: a connection box connected to electricity supply cables, a contact unit, a contact unit insulating housing bearing said contact unit, said housing surrounding said connection box, means supporting the insulating housing and the connection box for movement with respect to each other, and said housing contact unit and said box including, respectively, contact means which are closed by movement of the insulating

housing with respect to the connection box when the contact unit housing is pressed against the part to be treated, and said



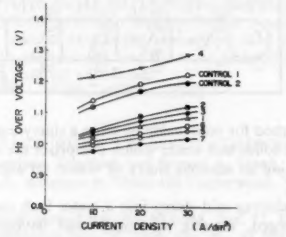
contact unit insulating housing contact means including a portion thereof for direct contact with said part to be treated.

4,224,133

CATHODE

Shuji Takahashi, Yokohama, Japan, assignor to Showa Denko K.K., Tokyo, Japan

Filed Dec. 7, 1977, Ser. No. 858,376
Int. Cl.[2] C25B *11/04;* B61D *17/00*
U.S. Cl. 204—290 R **7 Claims**



1. A cathode for the electrolysis of an aqueous solution of an alkali metal salt or water, said cathode consisting of a plate, lattice or mesh of iron, nickel-plated iron or nickel, of which the surface is plated in an aqueous electroless plating bath consisting of an aqueous solution of an inorganic salt of nickel, cobalt or iron, an alkali metal salt of hypophosphorous acid and as a reducing agent, 0.01 to 0.02 mole, per liter of the plating bath, of a water-soluble sulfur or selenium containing compound.

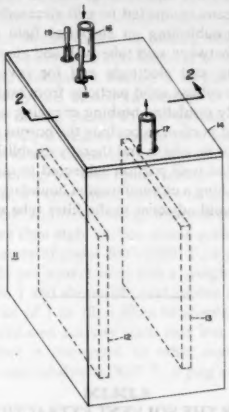
4,224,134

VERTICAL GEL SLAB ELECTROPHORESIS APPARATUS AND METHOD THEREFOR

Peter S. Hoefer, San Francisco, and Michael Whitesides, Daly City, both of Calif., assignors to Hoefer Scientific Instruments, San Francisco, Calif.

Filed Jan. 3, 1979, Ser. No. 714
Int. Cl.[2] G01N *27/26, 27/28*
U.S. Cl. 204—299 R **5 Claims**

1. Vertical gel slab electrophoresis apparatus comprising: a container for a conductive buffer solution and including a longitudinal sealing strip, a sample unit including a pair of spaced plates for containing gel and with open top and bottom slots; common means for retaining said sample unit in one orientation for sealing a slot against said strip to allow gel to be



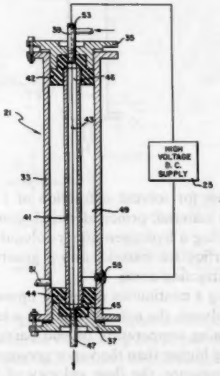
cast, and another orientation where said slot is displaced from said strip and exposed to a buffer solution to allow for electrophoresis.

4,224,135

CROSS-FLOW ELECTROFILTER AND METHOD

Dimitri Gidaspow, Northbrook; Chang H. Lee, Chicago, and Darsh T. Wasan, Westmont, all of Ill., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 1, 1978, Ser. No. 956,709
Int. Cl.[2] C10G *33/02*
U.S. Cl. 204—302 **6 Claims**



1. A cross-flow electrofilter for removing solid particles from a slurry of carbonaceous liquid comprising:

an elongated housing;

an electrically conductive filter tube having porous walls concentrically disposed within said housing to form first and second passageways respectively within said tube and within the annulus between said tube and housing, said filter tube having an inlet and an outlet at opposite end portions thereof for admitting slurry feed and discharging slurry concentrated in solid particles, said housing having

an outlet for discharging carbonaceous liquid filtrate that passes through the porous walls of said filter tube;

an elongated electrode extending along the lengthwise axis within said filter tube from its inlet to its outlet;

electrical means connected to said electrode and said filter tube for establishing an electrical field of 1000–10,000 volts/cm between said tube wall and electrode to attract particles to said electrode and for reversing electrical polarity to release solid particles from said electrode; and

an electrically insulating bushing engaging said filter tube at its inlet end portion to occlude the porous tube wall along a portion of its length and thereby establish a zone within the occluded wall portion subjected to said electric field for establishing a circumferential boundary of clear carbonaceous liquid adjacent to the filter tube wall.

4,224,136

PROCESS FOR THE SOLVENT EXTRACTION OF SOLID CARBON-CONTAINING MATERIALS, PRINCIPALLY COAL

Heinz M. zu Köcker, and Jürgen Tietze, both of Berlin, Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Nov. 7, 1978, Ser. No. 958,483

Claims priority, application Fed. Rep. of Germany, Nov. 8, 1977, 2749809

Int. Cl.[2] C10G *1/04*

U.S. Cl. 208—8 LE **13 Claims**

1. A process for solvent extraction of a solid, particulate carbonaceous material, principally coal, comprising

[a] introducing a hydrogen donor-solvent and the carbonaceous particulate material into a generally vertically directed extraction zone;

[b] imparting a continuous generally upwards directed flow to said solvent, the solvent being at a temperature above the softening temperature of said particles and the pressure being higher than the vapor pressure of the solvent at said temperature, the flow velocity of the solvent being sufficient to cause fluidization of said particles;

[c] withdrawing the solvent together with the formed extract continuously at the top of the extraction zone while preventing the entrainment of solid particles;

[d] effecting the separation of the extract and solvent outside said extraction zone;

[e] removing the remaining solid particles together with residual extract-free or extract-lean solvent from the extraction zone separately from the withdrawal at [c]; and

[f] separating the solvent removed at [e] from the solid particles.

4,224,137

RECOVERY OF CATALYSTS FROM THE HYDROGENATION OF COAL

Wilburn C. Schroeder, 7316 Radcliffe Dr., College Park, Md. 20740

Filed Aug. 4, 1978, Ser. No. 931,285

Int. Cl.[2] C10G *1/06;* B01J *37/00, 37/12;* C01G *45/00*

U.S. Cl. 208—10 **10 Claims**

1. A method for recovering hydrogenation catalyst from a carbonaceous, coal hydrogenation residue containing same along with coal ash, said catalyst comprising a compound of a metal having a volatilization temperature above the fusion temperature of coal ash, comprising introducing said residue into a synthesis gas generator operated at a temperature in the range of about 2400° F. to 3100° F. and in excess of the fusion temperature of the coal ash to provide hydrogen containing gases and molten ash containing catalyst at least in part in metallic form, withdrawing said molten ash from the synthesis gas generator, contacting said withdrawn molten ash with a chemical reactant which will form a compound with said metallic catalyst which compound has a volatilization temperature below the temperature of the molten ash, withdrawing volatilized catalyst compound from said ash and removing said compound for reuse.

4,224,138

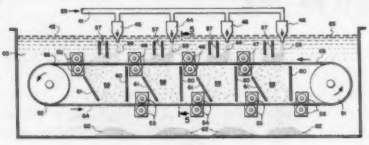
PROCESS FOR RECOVERING BITUMEN FROM OIL SAND

Jan Kruyer, 9707-67 A St., Edmonton, Alberta, Canada (T6B 1S3)

Filed May 10, 1979, Ser. No. 37,896

Int. Cl.[2] C10G *1/00*

U.S. Cl. 208—11 LE **42 Claims**



1. A method for recovering oil from a slurry containing oil, particulate solids and water which comprises the steps of:

(a) forming an aqueous slurry of water, oil and particulate solids,

(b) introducing said slurry into a water bath containing an submerged, moving apertured wall having oleophilic surfaces,

(c) bringing said slurry into contact with said submerged moving apertured wall at a temperature such that the oil has a viscosity in the range of 0.1 to 10,000 poises wherein the oil is attracted to the oleophilic surfaces and adheres thereto and the particulate solids pass through the apertures of said wall; and,

(d) recovering the adhering oil from the submerged, moving apertured wall while submerged.

4,224,139

TREATMENT OF SULFUR-CONTAINING LUBRICATING OIL TO INCREASE RESISTANCE TO OXIDATION

Sidney Schiff, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 16, 1979, Ser. No. 30,505

Int. Cl.[2] C10G *19/02*

U.S. Cl. 208—18 **8 Claims**

1. A method for treating sulfur-containing lubricating oil to increase its resistance to oxidation without significantly affecting its sulfated ash content comprising:

(a) contacting said oil with iodine and with an aqueous

solution of at least one compound containing an element of Group Ia or IIa of the Periodic Table of Elements and (b) separating the treated oil from the contacting step (a).

4,224,140

PROCESS FOR PRODUCING CRACKED DISTILLATE AND HYDROGEN FROM HEAVY OIL

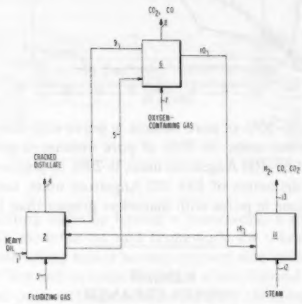
Kuniaki Fujimori, Tokyo; Yoshihito Satomi, Kurashiki; Teruo Suzuka, Kawaguchi, and Shirou Aizawa, Toda, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Filed Mar. 21, 1979, Ser. No. 22,385

Claims priority, application Japan, Jan. 30, 1979, 54/9413

Int. Cl.[2] C01B *1/08;* **C01G** *48/08;* **C10G** *13/02, 34/00*

U.S. Cl. 208—124 **15 Claims**



1. A process for producing a cracked distillate and hydrogen from a heavy oil which comprises cracking the heavy oil in the presence of laterite or a laterite-containing catalyst while simultaneously depositing coke on said laterite or laterite-containing catalyst, reducing the laterite or laterite-containing catalysts on which the coke is deposited while simultaneously burning the coke in a reducing atmosphere, and forming a hydrogen-rich gas by contacting the reduced laterite or laterite-containing catalyst with steam.

4,224,141

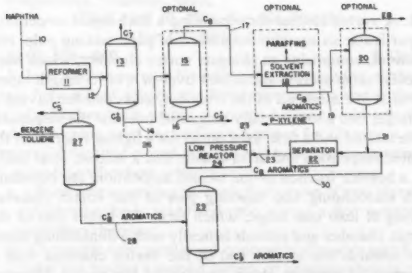
MANUFACTURE OF AROMATIC COMPOUNDS

Roger A. Morrison, Deptford, and Samuel A. Tabak, Wenonah, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 914,645, Jun. 12, 1978. This application May 21, 1979, Ser. No. 41,268

Int. Cl.[2] C10G *35/04;* **C07C** *5/24*

U.S. Cl. 208—134 **40 Claims**



1. A new use of known apparatus for simultaneously isomerizing xylenes and converting ethylbenzene to products readily separable by distillation from the mixture of C_8 aromatics by contacting a mixture of C_8 aromatics with a catalyst at conversion conditions of elevated temperature and low pressure in a loop comprising an isomerization reactor for the contact aforesaid, distillation means for separating C_8 aromatics from lower boiling and higher boiling hydrocarbons, means to transfer hydrocarbon effluent of said isomerization reactor to said distillation means, mixing means for mixing fresh feed C_8 aromatics containing xylenes and ethylbenzene with C_8 aromatics separated by said distillation means, a xylene separator for recovery of para xylene, means for transfer of mixed C_8 aromatics from said mixing means to said xylene separator, and means to transfer C_8 aromatics lean in para xylene from said xylene separator to said isomerization reactor, which new use comprises contacting, in the isomerization reactor of said known apparatus, a vapor phase mixture of said C_8 aromatics lean in para xylene and fresh charge material containing alkyl benzenes of more than eight carbon atoms with a zeolite catalyst at a temperature of about 800°–1000° F., a pressure of less than 100 pounds per square inch and a weight hourly space velocity between 1 and about 200; said zeolite catalyst having a constraint index of 1 to 12, a silica to alumina ratio greater than 12 and a reduced activity such that less than 2 weight percent of xylene is converted to other compounds when contacted with said catalyst at 900° F., 0 psig and LHSV of 5.

4,224,142

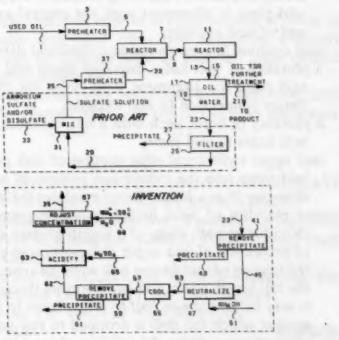
TREATMENT OF RECYCLED AMMONIUM SULFATE-BISULFATE SOLUTION

Bruce C. Benedict, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 29, 1979, Ser. No. 53,445

Int. Cl.[2] C01C *1/242;* **C10M** *11/00*

U.S. Cl. 208—179 **10 Claims**



1. A method for regenerating an aqueous ammonium sulfate-bisulfate treating solution containing metal and other contaminants which form ash, said method comprising:

(a) adjusting the pH of said solution to the range that produces a precipitate of said contaminant by addition of NH_3 or NH_4OH;

(b) cooling the pH adjusted solution to a temperature that substantially completes the precipitation;

(c) removing the precipitate from the solution;

(d) adjusting the pH of the solution after precipitate removal to the range of the treating solution before initial circulation by addition of H_2SO_4; and

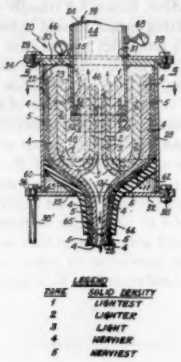
(e) adjusting the $SO_4^=$ ion concentration of the solution and the NH_4^+ ion concentration to the range of the treating solution before initial circulation.

4,224,143

CONSTRUCTION OF SHALLOW DISH WITH TAPERED ORIFICE FOR STREAMLINED FLOW CYCLONE WASHING OF CRUSHED COAL

Delbert I. Liller, P.O. Box 64, Deer Park, Md. 22150

Filed Jan. 11, 1979, Ser. No. 2,731
Int. Cl.[3] B04C 5/14
U.S. Cl. 209—211 16 Claims



1. A supporting plate adapted for changing the separable dish portion of a centrifugal cyclone, a jigging cyclone or a clarifying cyclone equipped with a vortex finder in combination with a replaceable conical dish having an upper cylindrical edge portion in the cyclone and a lower conical portion including an orifice portion below said plate said cyclone having a flange at its lower end and said plate being bolted thereto; connection at a flange to said cyclone;

said plate having a center hole through which said lower conical portion is inserted from the interior of said cyclone, said center hole being located to support the dish on said plate in alignment with the central axis of said dish and of said cyclone;

said cyclone having an inside cylindrical diameter B;

a plurality of bolt holes disposed about said center hole in said plate for alignment with holes for the bolts in the flange connection to said cyclone;

a plurality of bolts, each with a nut, extending through said bolt holes in said plate;

said upper cylindrical edge portion of dish projecting from said plate into the cylindrical portion of said cyclone of diameter B at a height between about 0.19B to 0.67B;

said plurality of bolts including an elongated fixture bolt threaded at both ends, of a length greater than the height of projection of said upper dish portion to permit a nut on the bottom of said fixture bolt to be loosened and to be slid the full length of the bolt to its bottom threaded end where it may be turned one half to a few turns to provide a stop against which the dish is dropped to rest on the plate and pivoted away from the open cyclone to permit, adjustment of the vortex finder repair, or replacement of parts in the cyclone.

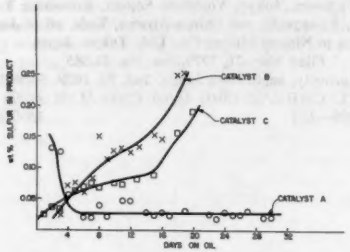
4,224,144

HYDROTREATING A HYDROCARBON STREAM TO REMOVE NITROGEN AND SULFUR

Albert L. Hensley, Jr., Munster, Ind.; Leonard M. Quick, Naperville, and P. Donald Hopkins, St. Charles, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 19, 1979, Ser. No. 21,575
Int. Cl.[2] C10G 23/02
U.S. Cl. 208—216 PP 28 Claims

1. A process for hydrotreating a hydrocarbon stream to remove nitrogen and sulfur which process comprises contacting a hydrocarbon stream comprising a stream selected from petroleum distillate, tar sands distillate, and shale oil, with hydrogen and a catalyst comprising a porous refractory inorganic oxide and deposited thereon hydrogenation components comprising chromium, molybdenum and at least one Group VIII metal said catalyst having a pore volume distribution



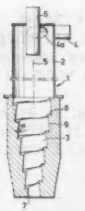
comprising 20–50% of pore volume in pores with diameters of 0–50 Angstrom units, 30–70% of pore volume in pores with diameters of 50–100 Angstrom units, 0–20% of pore volume in pores with diameters of 100–150 Angstrom units, and 0–10% of pore volume in pores with diameters greater than 150 Angstrom units.

4,224,145

VORTEX CLEANER

Karl A. Skardal, Bergstigen, Sweden, assignor to Cellwood Grubbens AB, Stockholm, Sweden

Filed Nov. 24, 1978, Ser. No. 963,356
Claims priority, application Sweden, Dec. 2, 1977, 7713730; Nov. 7, 1978, 7811510
The portion of the term of this patent subsequent to May 29, 1996, has been disclaimed.
Int. Cl.[2] B04C 5/16
U.S. Cl. 209—211 8 Claims



1. A vortex cleaner for separating a fibre-liquid-suspension, in particular an aqueous suspension of papermaking pulp, into fractions, comprising an elongate vortex chamber, which has a circular cross-section and which over part of its length tapers towards one axial end of the chamber, said chamber having at its larger end a substantially tangential inlet for the suspension to be treated and a first, axial outlet for a lighter fraction of the treated suspension and at its smaller end a second, axial outlet for a heavier fraction of the treated suspension, the boundary wall surrounding said tapering part of the vortex chamber having at least one ledge, which faces the larger end of the vortex chamber and extends helically with a diminishing diameter towards the smaller end of the vortex chamber with a direction of rotation about the axis of the vortex chamber corresponding to the flow direction of a suspension flow injected through said tangential inlet, and a sidewall interconnecting the consecutive convolutions of said ledge, said sidewall being inclined relative to the axis of the vortex chamber so

as to be conically divergent towards the smaller end of the chamber.

4,224,146

SIFTING MACHINES

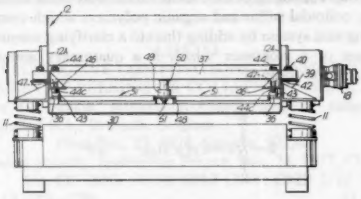
Anthony J. Kent, Newark, and William Woodburn, Aberdeen, both of Great Britain, assignors to United Wire Group Limited, Edinburgh, Great Britain

Filed Sep. 11, 1978, Ser. No. 941,803

Claims priority, application United Kingdom, Sep. 13, 1977, 38083/77; Sep. 13, 1977, 38084/77

Int. Cl.[2] B07B *1/46*

U.S. Cl. 209—243 **5 Claims**



1. A sifting machine having a framework; a sifting basket resiliently mounted on said framework for vibratory movements, said sifting basket having opposed side walls, each with an inner face and an outer face, and a base formed by a screen tensioned on a rectangular screen frame; clamping means releasably securing said screen frame to said side walls; and a drive unit for effecting vibratory movement of said sifting basket; said clamping means comprising at least one bar spaced above said screen and extending across said basket and having opposed end portions projecting through apertures in said side walls respectively; a pair of brackets on the outer faces of said side walls; releasable fastening devices securing said end portions of the bar to said brackets; a pair of ledges respectively on opposed inner faces of said side walls; a pair of plungers carried by said bar and resiliently clamping opposed side members of said screen frame against said ledges respectively, and spring means located between said bar and each of said brackets for moving said bar upwards, when said fastening devices are released.

4,224,147

FILTER APPARATUS FOR REMOVING CONTAMINANTS FROM A FLUID STREAM HAVING IMPROVED WITHDRAWAL MEANS FOR SPENT ADSORBENT

Donald P. Traut, Arvada, Colo., assignor to Helix Technology Corporation, Waltham, Mass.

Filed May 10, 1978, Ser. No. 904,650

Int. Cl.[2] B01D *23/20*

U.S. Cl. 210—660 **8 Claims**

1. In a filter apparatus for adsorptively removing contaminants from a fluid stream, and filter apparatus having a plurality of adsorber beds within an outer housing, said adsorber beds containing solid particulate adsorbent for filtering a contaminant from fluid passed through said beds, the improvement of providing adsorbent withdrawal means comprising:

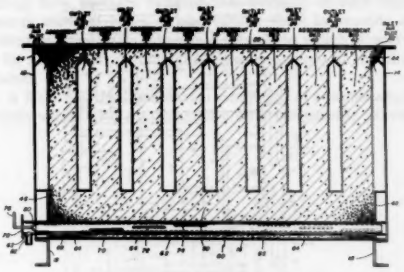
a. a fixed tube extending through the bottom of said plurality of adsorber beds, said fixed tube having a first pattern of openings therein;

b. a rotatable tube positioned concentrically with said fixed tube and having a second pattern of openings therein, said second pattern of openings being different from said first pattern and being arranged so that only a portion of openings in the second pattern come into alignment with holes in said first pattern for a given position of the rotatable tube whereby adsorbent can be withdrawn through the aligned openings;

c. means for externally rotating said rotatable tube to bring a portion of the holes in said fixed tube and said rotatable tube into alignment whereby adsorbent can be emptied from an adsorber zone located where said holes are aligned; and,

d. means for pneumatically conveying adsorbent withdrawn from an adsorber zone into said withdrawal means from said filter apparatus.

8. A method for withdrawing adsorbent from a filter apparatus having a plurality of adsorber beds, said adsorber beds containing solid particulate adsorbent for filtering a contaminant from fluid passed through said beds, comprising:



a. extending a fixed tube through the bottom of said plurality of adsorber beds, said fixed tube having a first pattern of openings therein;

b. positioning a rotatable tube concentrically with said fixed tube, said rotatable tube having a second pattern of openings therein which second pattern is different from said first pattern and is arranged so that a portion of the openings in said second pattern come into alignment with holes in said first pattern for a given position of said rotatable tube;

c. rotating said rotatable tube to bring a portion of holes in said rotatable and fixed tubes into alignment whereby adsorbent can be emptied from an adsorber zone located at said aligned holes; and,

d. pneumatically conveying adsorbent from said filter zone through the aligned holes and out of the filter apparatus.

4,224,148

GALVANIC FLOW SYSTEM FOR JOINT PARTICULATE RECOVERY AND LIQUID PURIFICATION

William E. Lindman, 10189 Oriole Ave., Fountain Valley, Calif. 92708, and John A. Alexander, 12040 E. Florence Ave., Santa Fe Springs, Calif. 90670

Continuation of Ser. No. 597,217, Jul. 18, 1975, abandoned. This application Oct. 7, 1977, Ser. No. 840,414

Int. Cl.[2] B01D *21/01*; C02B *1/20*

U.S. Cl. 210—714 **20 Claims**

1. That process for separating as a solid, a contaminant from a polar liquid, said process comprising:

(a) in an electrically insulated environment, providing said body of flowable material consisting essentially of a polar liquid having dispersed therein a minimum of about 0.1% by weight of particles which will accept a galvanic charge, all of which particles have a density of about 1.05 to about 2.0 and a size of about 30 to about 225 microns diameter with free surface energy of about 100 to 500 ergs/cm^2,

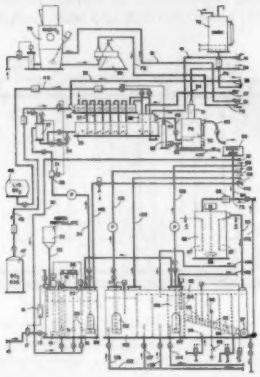
(b) introducing an effective amount of ferrous ions into said flowable material to flocculate said contaminant,

(c) introducing sulfur dioxide into said body of flowable material to impart a galvanic charge on said particles by providing free electrons through the flowable body while maintaining an acidic ph of about 2.0 to about 2.5,

(d) exposing said flowable body to turbulent oxidizing conditions produced by gaseous oxygen introduced therein which will oxidize said ferrous ions to ferric ions,

(e) continuing the flow of said body through the electrically insulated environment so as to maintain the charge on said particles and at a rate adapted to prevent coalescence of the particles while maintaining said acidic pH and oxidizing said ferrous ions to ferric ions,

(f) changing the pH of said body to an alkaline pH of about 8 to about 11 to reverse the galvanic charge on the flowing particles,



(g) electrically grounding said body to cause the charged particles to mutually coalesce with said ferric ions and separate from the body of liquid as a precipitate including said contaminant, and

(h) separating said contaminant and liquid from each other and removing same from said environment.

13. A process according to claim 1 which includes the step of reintroducing to said body of step e about 15% to about 30% of said precipitate and additionally adding soda ash, then heating the resulting mixture at about 100° F. to about 110° F. with agitation, then flocculating the same, thereby increasing the removal of silica, magnesium and calcium from the medium.

4,224,149

PROCESS USEFUL IN THE FLOCCULATION OF PHOSPHATE SLIMES

James S. Balcerski; Arthur M. Schiller, both of Stamford, Conn., and Arthur Snow, Alexandria, Va., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 30, 1979, Ser. No. 34,118

Int. Cl.[2] C02B *1/20*

U.S. Cl. 210—705 **6 Claims**

1. In a process for flocculating phosphate slimes containing calcium ions which comprises treating said slimes with an anionic polymeric flocculant deriving its anionicity from carboxylic acid groups and settling solids of the thus-treated slimes, the improvement which comprises adding to said slimes an effective amount of a precipitant or sequestrant for said calcium ions.

4,224,150

PROCESS FOR CLARIFYING AQUEOUS SYSTEMS EMPLOYING QUATERNARY AMMONIUM ADDUCTS OF POLYMERIZABLE TERTIARY AMMONIUM SALTS AND ACRYLAMIDE

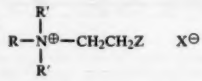
Rudolf S. Buriks; Allen R. Fauke, and David W. Griffiths, all of St. Louis, Mo., assignors to Petrolite Corporation, St. Louis, Mo.

Division of Ser. No. 523,813, Nov. 24, 1974. This application Oct. 27, 1978, Ser. No. 955,444

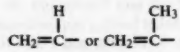
Int. Cl.[2] C08F *120/00, 8/30*; C02C *3/00, 5/02*

U.S. Cl. 210—735 **6 Claims**

1. A process of clarifying an aqueous system which is water containing oil, emulsified oil or suspended solids selected from the group consisting of oil coated solids, iron oxide containing solids, colloidal sulfur and organic polymers which comprises treating said system by adding thereto a clarifying amount of a polymer of a monomer which is a quaternary ammonium adduct of the formula



where R is a polymerizable group terminating in



moieties, the R′ groups are alkyl groups,

or CN, each R″ is hydrogen or alkyl, X is an anion, and where the quaternary nitrogen is attached to four carbon atoms.

4,224,151

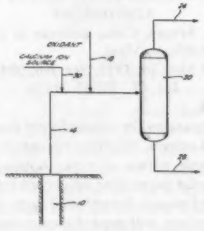
PREVENTING SCALE DEPOSITION FROM GEOTHERMAL FLUIDS

John W. Jost, Anaheim, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. No. 875,383, Feb. 6, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,480

Int. Cl.[2] C02B *5/02*

U.S. Cl. 210—696 **14 Claims**



1. A method for preventing scale deposition from a hydrogen sulfide-containing, two-phase geothermal fluid, comprising:

(a) flowing from a subterranean formation through a well to the earth surface a hot two-phase geothermal fluid comprised of (1) a hydrogen sulfide-containing vapor phase and (2) a liquid phase contaning dissolved hydrogen sul-

fide, dissolved barium and dissolved heavy and/or transition metals;

(b) injecting into the geothermal fluid which also contains at least about 10 moles of dissolved calcium per mole of hydrogen sulfide a gas comprised of oxygen at a rate sufficient to provide therein an oxygen to hydrogen sulfide molar ratio between about 0.75 and about 1.75, and mixing said gas with said geothermal fluid so as to selectively oxidize said hydrogen sulfide to sulfur and/or water soluble sulfide oxidation products wherein the sulfur has a valence less than plus six; and

(c) thereafter separating said two-phase geothermal fluid into (1) a gaseous phase comprised of steam and noncondensible gases and (2) a hot brine containing said sulfur and/or water-soluble sulfide oxidation products.

4,224,152

SURFACE ACTIVE COMPOSITIONS AND METHOD OF USE IN DISPERSING OR COLLECTING OIL SLICK

André O. Lepain, Rosiéres-St-André, Belgium, assignor to Labofina S.A., Brussels, Belgium

Filed Dec. 27, 1978, Ser. No. 973,665

Claims priority, application France, Dec. 28, 1977, 77 39425

Int. Cl.[2] B01F *17/34;* **B01J** *13/00;* **C02B** *1/18*

U.S. Cl. 210—729 **11 Claims**

1. A surface-active composition for collecting or dispersing oil slicks on a water surface or for protecting or cleaning beaches,

said composition comprising from about 18 to about 40% by weight of a mixture of surface-active compounds including at least one solid surface-active sorbitan monoester of a saturated aliphatic carboxylic acid having from 16 to 20 carbon atoms;

said solid sorbitan monoester comprising from about 16 to about 25% by weight of said surface-active compound mixture; said surface-active compound mixture further comprising at least one surface-active compound selected from the group consisting of liquid monoesters of aliphatic carboxylic acids having from 10 to 20 carbon atoms with sorbitan or with polyethylene glycol;

said liquid surface-active compound comprising from about 75 to about 84% by weight of said surface-active compound mixture;

said composition further comprising from about 60 to about 82% by weight of a mixture of solvents comprising a glycol ether and at least one n-paraffin having from 10 to 16 carbon atoms;

said glycol ether comprising from about 20 to about 50% by weight of said solvent mixture and said n-paraffin comprising from about 50 to about 80% by weight of said solvent mixture.

10. A method for dispersing or collecting an oil slick on water, comprising the step of applying a surface-active composition as defined by claim 1 to the surface of the water affected by the oil slick.

4,224,153

PROCESS AND A FILTER FOR FILTERING A LIQUID CONTAINING SOLIDS HAVING A SUBSTANTIALLY DIFFERENT SPECIFIC GRAVITY RELATIVE TO THE LIQUID

Hans Müller, Erlenbach, Switzerland, assignor to Chemap AG, Maennedorf, Switzerland

Continuation of Ser. No. 851,756, Nov. 15, 1977, Pat. No. 4,152,261. This application Nov. 13, 1978, Ser. No. 959,590

Claims priority, application Switzerland, Dec. 24, 1976, 16363/76

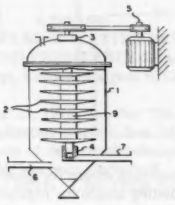
The portion of the term of this patent subsequent to May 1, 1996, has been disclaimed.

Int. Cl.[2] B01D *33/26*

U.S. Cl. 210—780 **4 Claims**

1. A process for filtering a filtrant composed of a liquid which contains solids with a substantially different specific gravity relative to the liquid and having a tendency to generate irregular cake formations of solids on at least one filter element having a hollow interior within a filter mesh, the process comprising mounting all filter elements on a vertical hollow shaft having bores on a surface thereof arranged in communication with said interior of each filter elements and with an outlet of a vessel containing said filter element; passing the filtrant through all filter meshes into the interior of each filter element; passing the filtrant through said bores of said shaft to permit the filtrant to flow out of the vessel; and establishing a pressure differential between the ambient space surrounding each filter element and the interior of said shaft by independently rotatably mounting at least one means for changing differential pressure including flow-restricting member on the shaft for restricting flow passages between said interiors of each filter elements and said bores of said hollow shaft to provide an elevated pressure of an adjustable magnitude which is operative for substantially avoiding the cake formations on the filter elements.

4. A filter for filtering a filtrant composed of a liquid which contains solids with a substantially different specific gravity



relative to the liquid and having a tendency to generate irregular filter cake formations on a filter element, comprising a filter vessel including at least one generally horizontal filter element having an inlet constituted by a filter mesh at the upper side of the filter element, an impervious bottom plate affixed to said filter mesh, each filter mesh and said bottom plate constituting a hollow interior of each filter element, a hollow vertical shaft passing through and supporting each filter element, said hollow shaft associated with an outlet of said vessel and being formed with a plurality of perforating bores communicating with said hollow interiors of said filter elements and the interior of said shaft, at least one means for changing differential pressure including flow-restricting member independently rotatably mounted on said shaft within said hollow interior of each of said filter element, said flow-restricting member being arranged for partially blocking at least one of said bores so as to establish a pressure differential between the ambient space surrounding the filter elements and the interior of said shaft thereby providing an elevated pressure of a magnitude which is operative for substantially avoiding the filter cake formations of the surface of the filter elements.

4,224,154

SWIMMING POOL CHEMICAL CONTROL SYSTEM

Jacques M. Steininger, 126 E. Haley St., No. A-16, Santa Barbara, Calif. 93101

Continuation-in-part of Ser. No. 791,929, Apr. 28, 1977, abandoned. This application Dec. 20, 1978, Ser. No. 971,306

Int. Cl.[2] C02B *3/08;* **G05D** *11/08*

U.S. Cl. 210—85 **4 Claims**

1. A system for controlling the chemical balance within a given range of a swimming pool of water having at least a recirculating water line and a pump in the recirculating water line which, when operating, forces water through the recirculating water line, the system including:

a least one sensor in the recirculating water line for continuously determining the chemical balance of the pool and

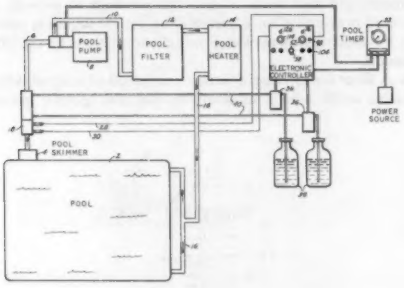
for producing an output indicative of that chemical balance:

means for dispensing a chemical to the pool downstream of the sensor to adjust the chemical balance of the pool towards the desired balance; and

control means, said control means comprising:

(i) comparator means for comparing the output of the sensor with a predetermined value and producing an output when the output of the sensor departs from said predetermined value; and

(ii) timing means coupled to said dispensing means and to said comparator means for controlling the duty cycle to said dispensing means such that when actuated by the output of said comparator means, the duty cycle of said dispensing means may be selectively limited, the timing



means comprising means for generating a cyclic waveform, regulating means for regulating the timing means to provide a dispensing time period from only a small fraction of the duty cycle to substantially the entire duty cycle comprising means for clipping the cyclic waveform produced by said generator means, means for applying the clipped cyclic waveform to the dispensing means in such a manner that when the comparator means produces an output, it causes the dispensing means to dispense for only a portion of the cyclic waveform.

4. A system as set forth in claim **1** including means to detect and signal an out-of-range condition of the chemical balance of the pool, said means centering the out-of-range detection about the predetermined value.

4,224,155

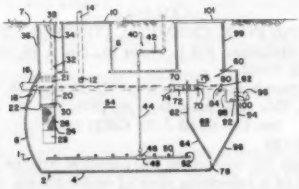
SEWAGE TREATMENT APPARATUS

George A. Milne, 45-535 Luluku Rd., Na Pali Gardens, Apt. B-31, Kaneohe, Hi. 96744

Continuation-in-part of Ser. No. 309,516, Nov. 24, 1972, Pat. No. 3,907,672, and Ser. No. 246,253, Apr. 21, 1972, Pat. No. 3,859,215. This application Jan. 6, 1975, Ser. No. 538,856

Int. Cl.[2] **C02C** *1/12;* **B01D** *23/28*

U.S. Cl. 210—117 **2 Claims**



1. Self-contained closed aerobic sewage treatment apparatus having a closed tank with a cylindrical wall positioned around a generally horizontal axis, and with first and second end walls joining the cylindrical wall in completion of the closed tank, pipe means connected inside a bottom of the tank for introducing air into the bottom of the tank, a sewage inflow opening in the first end wall and an effluent outflow opening in the second end, and further having sewage inflow means connected to the inflow opening and outflow means connected to the effluent outflow opening, and wherein the inflow means further comprises an inflow pipe, a holder means connected to the inflow pipe, and positioned within a chamber and having a downward opening and an inward extending rim, about the opening a receiver means connected to the holder means and mounted on the rim, the receiver means defining an outer foraminous wall extending upward from a lower imperforate wall and bottom and a handle connected to the receiver means and extending through the opening, whereby the receiver means is removed from the chamber and the holder via the opening for emptying the receiver means, further comprising a chamber configured for supporting the holder means, and wherein the sewage inflow pipe flows in through an opening in the chamber into the holder means, wherein the receiver means is supported by the holder means in dependent relationship, and wherein the receiver means foraminous wall portion extends downward from the holder means for flowing sewage out of the holder means and receiver means through the foraminous wall portion, and for retaining solids within the receiver means, and further comprising a connection pipe connecting the chamber to the inflow opening of the closed tank, wherein the chamber further comprises a plurality of connection pipes extending outward from a bottom of the chamber to a like plurality of closed tanks, wherein a bottom wall of the chamber is grooved and wherein grooves lead outward from a central portion of the bottom wall to opening partially formed by a side wall of the chamber, and partially formed by the bottom wall grooves.

4,224,156

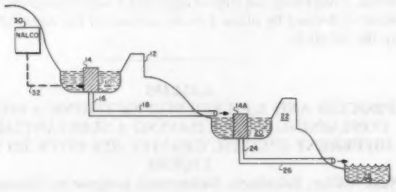
WEIR SKIMMER

Dennis G. Pardikes, Chicago; William F. Flowers, Bollingbrook; Al S. Huff, Country Club Hills, and Andrew J. Young, Barrington, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Nov. 9, 1978, Ser. No. 959,263

Int. Cl.[2] **B01D** *23/00*

U.S. Cl. 210—123 **2 Claims**



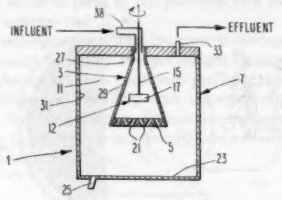
1. An apparatus for controlling the liquid level of overflow ponds and the like comprising a vertical standpipe having a polymer feed inlet near its bottom, a valve for controlling flow of polymer to the polymer feed inlet, at least **1** fluid discharge inlet near the bottom of the vertical standpipe, flexible hose means connecting the fluid discharge inlet to a corresponding opening located in a horizontal plate member which is adapted to ride up and down on the vertical standpipe, said horizontal plate member being fitted with float means, filter means, and valve shut off means.

4,224,157

PROCESS AND APPARATUS FOR SEPARATING SOLIDS FROM SUSPENSIONS OF INFLUENT

Kamlesh K. Jain, Phoenixville, Pa., assignor to Fram Industrial Filter Corporation, Tulsa, Okla.

Filed Mar. 16, 1979, Ser. No. 21,276
Int. Cl.[2] B01D *21/01*
U.S. Cl. 210—208 6 Claims



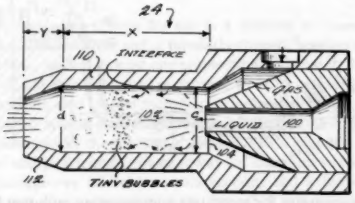
1. Apparatus for separating suspended solids from a liquid comprising a mixing chamber, means in said mixing chamber for mixing said liquid to promote agglomeration of said suspended solids, a settling chamber in which said suspended solids settle from said liquid, and hydrodynamic means communicating said mixing chamber with said settling chamber for minimizing momentum transfer to the liquid in the settling chamber to thereby maximize the rate of sedimentation of the solids suspended in the liquid, said hydrodynamic means including a plate separating the mixing chamber from the settling chamber, said plate having perforations defining spaced flow paths through the plate, said flow paths being inclined with respect to the plane normal to the plane of the plate so that the liquid communicated through said flow paths has a tangential velocity component, said flow paths being dimensioned and positioned within said plate for cancelling the tangential velocity components of the liquid exiting said flow paths.

4,224,158

AERATION SYSTEM AND METHOD WITH TAPERED NOZZLE

Allen E. Molvar, Barrington, R.I., assignor to Clevepak Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 863,588, Dec. 22, 1977, Pat. No. 4,157,304, and Ser. No. 863,587, Dec. 22, 1977, Pat. No. 4,152,259. This application Oct. 20, 1978, Ser. No. 953,212
Claims priority, application Japan, Nov. 22, 1977, 52-40554; Nov. 22, 1977, 52-40555
Int. Cl.[2] B01F *3/04;* C02C *1/08*
U.S. Cl. 210—220 7 Claims



1. A system for aerating waste water in a body of waste water comprising:

at least one mixing chamber adapted for immersion in said body for providing a waste water passage, including:

an extending chamber;

a liquid passage for guiding waste water flow into said extending chamber, the cross-sectional area of the liquid passage at the entry to said extending chamber being less than the cross-sectional area of said extending chamber at that entry so as to form a step region, and said extending chamber including a first section extending from said step region and a second inwardly tapered section extending from said first section, shorter than said first section along the direction of water flow and tapering inwardly at a rate greater than any inward taper of said first section so as to maintain mixing within said extending chamber over a wide range of gas flow rates; and

means defining at least one gas passage terminating in said step region for injecting gas into said extending chamber, to form parallel gas and water streams, said extending chamber extending downstream from said gas passage for confining flow of the parallel gas and water streams for a distance until the interface between said streams becomes unstable in said extending chamber and vortices are tripped to produce gas bubbles which are mixed with the water stream;

means for pumping said waste water through said at least one mixing chamber;

means for mounting said mixing chamber below the surface of said body of water; and

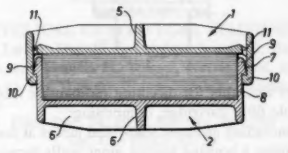
means for injecting an aerating gas into waste water within said mixing chamber.

4,224,159

DEVICE FOR DIFFUSING MATTER BETWEEN TWO FLUIDS VIA SEMI-PERMEABLE DIAPHRAGMS

Gerhard Riede, Vellinge, Sweden, assignor to Cambro AG, Switzerland

Filed Aug. 23, 1976, Ser. No. 716,479
Claims priority, application Sweden, Sep. 11, 1975, 7510097
The portion of the term of this patent subsequent to Dec. 13, 1994, has been disclaimed.
Int. Cl.[2] B01D *13/00;* C02B *1/82*
U.S. Cl. 210—232 11 Claims



1. In an apparatus for diffusing matter between two fluids comprising a plurality of spacing plates, a plurality of pairs of semi-permeable membranes, said spacing plates including flow passages for each of said fluids, so that when said spacing plates and said pairs of semi-permeable membranes are arranged in a stacked configuration, one of said fluids may be passed between said pairs of semi-permeable membranes and said other fluid may be passed between said spacing plates and said pairs of semi-permeable membranes, a first clamping plate, a second clamping plate, and means for clamping said first clamping plate to said second clamping plate with said stacked configuration pressed therebetween, the improvement which comprises said first and second clamping plates being substantially rectangular in configuration and including tapered end portions, said first clamping plate including a pair of laterally extending side walls forming said first clamping plate into a substantially cup-shaped configuration, said flow passages being provided at said tapered end portions of said first and second clamping plates so that the distance from said flow passages to said laterally extending side walls is substantially reduced, and including means for engaging said side walls of said first clamping plate to said second clamping plate at a plurality of locations substantially around the entire periphery of said apparatus, including said tapered end portions, in order to contain said stacked configuration under increased pressure therebetween, said laterally extending side walls of said first

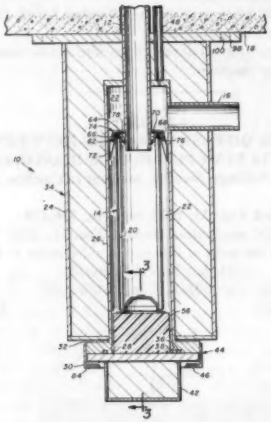
clamping plate corresponding to greater than one-half of the lateral surface area of said stacked configuration, so that said first clamping plate can be tightly engaged with said second clamping plate without the need to employ any additional clamping means therewith.

4,224,160

BOTTOM LOADED FILTER FOR RADIOACTIVE LIQUIDS

William G. Wendland, Enfield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 8, 1978, Ser. No. 967,819
Int. Cl.[2] B01D *27/00*
U.S. Cl. 210—236 **16 Claims**



1. A filter assembly for directing radioactive fluids through a replaceable filter cartridge, comprising:

a vessel including an outer lead-filled jacket at least partially enveloping a housing having inner walls forming a chamber for containing a removable filter cartridge, the vessel including a rigid flange defining an opening in the lower end of the chamber;

an inlet conduit extending through the vessel and terminating within the chamber;

an outlet conduit extending through the vessel and terminating within the chamber;

rail means connected to the vessel and extending laterally to one side thereof the rail means including track means spaced on either side of the opening and below the flange;

hatch means for engaging the flange to sealingly close the opening, the hatch means including a lower shield and being movable on the track means from a first position directly below the opening to a second position lateral of the opening whereby the filter cartridge may be passed through the track means for insertion and removal in the chamber;

a spacer plug disposed in the lower portion of the chamber and supported therein by the hatch means in the first position, for supporting the filter cartridge within the chamber, the plug being adapted to freely pass through the rail means when the hatch is moved to the second position; and

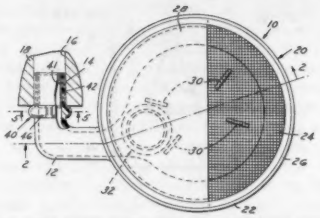
guide means supported in fixed relation to the terminus of one of the conduits for receiving the filter cartridge and properly orienting the cartridge with respect to said one conduit.

4,224,161

OIL PUMP INLET SCREEN ASSEMBLY

David L. Anderson, Muskegon, and A. David Joseph, North Muskegon, both of Mich., assignors to Sealed Power Corporation, Muskegon, Mich.

Continuation-in-part of Ser. No. 906,256, May 15, 1978, abandoned. This application Jun. 27, 1979, Ser. No. 52,667
Int. Cl.[2] B01D *25/04*
U.S. Cl. 210—232 **5 Claims**



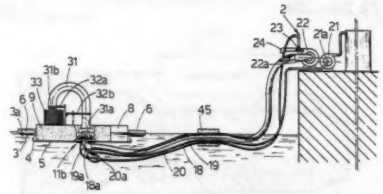
1. In an oil pump inlet screen assembly adapted to be immersed in an oil sump and comprising a filter screen including a housing, a pipe connected at one end to said housing and adapted to be received by press fit connection at the other end into an opening in an oil pump housing to feed oil from said sump through said housing and pipe to said pump, the improvement wherein said housing and pipe are molded integrally of thermoplastic material having poor dimensional stability due to characteristics of said material such as cold flow or hygroscopy, and wherein said screen assembly further comprises a one-piece metal eyelet received over said other pipe end in structural engagement with the inner and outer walls of said other pipe end and adapted for press-fit engagement with a said pump opening in sealing engagement with both said pipe end and said pump opening.

4,224,162

APPARATUS FOR COLLECTING LIQUIDS AND/OR SLIMES FLOATING ON LIQUID SURFACES

Giuseppe Ayroldi, Piazza Mincio 4, Roma, Italy

Filed May 16, 1979, Ser. No. 39,597
Claims priority, application Italy, May 16, 1978, 49410 A/78
Int. Cl.[3] E02B *15/04*
U.S. Cl. 210—242 R **7 Claims**



1. An apparatus for separating and removing polluting liquid or slimes floating on water or other liquid surface which comprises:

a flexible floating platform of a substantially circular form having a specific gravity less than that of the water or other liquid surface, at a center of which a free space is arranged in which a suction device is mounted, said platform consisting of an annular outer floating member comprising an annular flexible band having a peripheral weir lip and supported by a plurality of floating bodies spaced apart from each other so as to define therebetween radial channels and so shaped, constructed and dimensioned as

to maintain the weir lip at a predetermined depth, and of a central flexible circular plate supported by a plurality of floating members so positioned as to define a pluraliy of substantially radial channels in fluid flow communication of the first plurality of outer entrance channels, as well as a central free space, the peripheral annular outer floating part and the central floating part of the platform being connected to one another by an annular skirt flexible member so as to form in the platform two independent floating systems and;

a suction unit mounted within the central free space of the platform and including at least a rigid suction pipe, the inlet orifice of which is positioned just over the bottom of the platfrom and coaxially with the vertical axis X—X thereof, the suction pipe being connected through a flexible pipe, to a pumping unit mounted on a remote supporting element.

4,224,163

DIALYZER CONNECTOR SYSTEM WITH SNAP-LOCK BUTTON-TYPE CONNECTOR AND O-RING

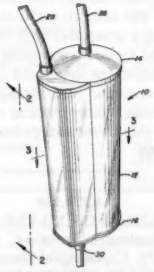
Richard P. Goldhaber, Libertyville; Jimmy L. Miller, Waukegan; Burton Salkin, Schaumburg, and William J. Schnell, Arlington Heights, all of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation of Ser. No. 620,617, Oct. 8, 1975, abandoned. This application Aug. 22, 1977, Ser. No. 826,364

The portion of the term of this patent subsequent to Feb. 1, 1994, has been disclaimed.

Int. Cl.[2] B01D *13/00*

U.S. Cl. 210—321 B **9 Claims**



1. A connector system for use in a dialyzer to connect an external fluid conduit and a tubularly-shaped, semipermeable membrane, having at least one connecting aperture in the wall thereof, and to protect said membrane from forces imposed on said conduit, said system including: a jack member adapted to be secured within said dialyzer and having means defining a fluid passageway therethrough, and means associated with one end of said jack member passageway for coupling said conduit and passageway in fluid communication; and a button-type connector for cooperation with the other end of said jack member passageway and membrane connecting aperture for connecting said passageway and said tubular membrane, said connector including a cap and a barrel extending from said cap, said connector having a passageway extending through said cap and barrel, and having means for locking cooperation with said passageway, and elastomeric sealing means for sealingly engaging said jack member at a position surrounding said other end of said passageway, for sealingly engaging said connector barrel, and for sealingly engaging the outside surface of said membrane adjacent said cap for firmly urging the membrane against the underside of the cap.

4,224,164

NON-WICKING POLYURETHANE CASTING SYSTEMS

Melvin Brauer, East Brunswick; Barton C. Case, Howell, and Thaddeus F. Kroplinski, Bound Brook, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 890,212, Mar. 27, 1978, abandoned, which is a continuation-in-part of Ser. No. 741,275, Nov. 12, 1976, abandoned. This application Oct. 20, 1978, Ser. No. 953,112

Int. Cl.[2] B01D *31/00*

U.S. Cl. 210—321 B **3 Claims**

1. A hollow fiber separatory device capable of use in biomedical applications comprising a hollow fiber bundle consisting of a plurality of fine hollow fibers whose end portions are potted in a tube-sheet and whose open fiber ends terminate in a tube-sheet face, the resulting bundle being sealed within a casing to form a separatory cell having one or more fluid ports which allow for the passage of one fluid through the fibers and another around the fibers without mixing of the two fluids, said tube-sheet comprising a cured polyurethane composition comprising the reaction product of (1) a polyol mixture of (a) at least one polyol, and (b) N-N-N′-N′-tetrakis (2-hydroxypropyl) ethylene diamine, and (2) an isocyanate terminated polyurethane based prepolymer, said diamine being present in said polyol mixture in an amount sufficient to cause the viscosity of the urethane system to increase rapidly upon mixing of said polyol containing mixture and said prepolymer to form a gel which turns to a solid upon standing without markedly increasing the initial mix viscosity of the urethane system, thereby permitting placement of said urethane system and substantially reducing wicking of said urethane system after placement, said amount providing a ratio of equivalents of the N-N-N′-N′-tetrakis (2-hydroxypropyl) ethylene diamine to the polyol of from 5:95 to 40:60, and said polyol and said prepolymer being reacted in amounts to provide an NCO-OH equivalent ratio of about 1 to 1.1:1.

4,224,165

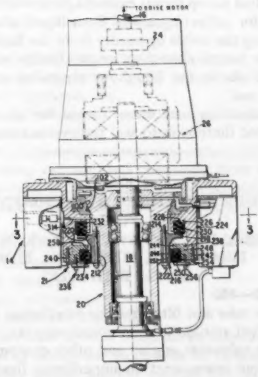
CYCLICAL CENTRIFUGAL MACHINE

Thomas R. Laven; Donald L. Hurley; Joseph B. Bange, all of Hamilton, and Francis H. Wessel, North Bend, all of Ohio, assignors to The Western States Machine Company, Hamilton, Ohio

Filed Dec. 14, 1978, Ser. No. 969,393

Int. Cl.[2] B01D *33/10*

U.S. Cl. 210—363 **12 Claims**



1. In a cyclical centrifugal machine having a gyratory suspension head, including rigid support means to be mounted above the basket of the machine, a bearing housing suspended from said support means for gyratory motion, a basket spindle rotatable in fixed position relative to said housing on bearings therein, and buffer means to resist gyration of said spindle and

bearing housing, the improvement wherein said buffer means comprises:

a radial annular abutment surface fixed to one of said support means and said housing and, fixed to the other of them, rigid means forming a first annular channel that confronts said radial surface, said channel having an elastic ring confined therein and protruding therefrom in pressing engagement with said radial surface;

an axial annular abutment surface fixed to one of said support means and said housing and, fixed to the other of them, rigid means forming a second annular channel that confronts said axial surface, said second channel confining therein an elastic ring protruding therefrom in pressing engagement with said axial surface; and

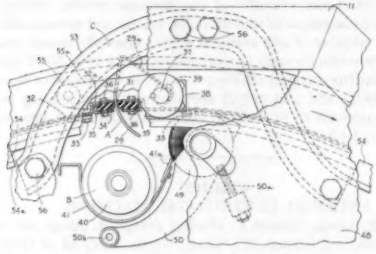
means for independently adjusting the pressure between either of said surfaces and the related elastic ring without altering the pressure between the other of said surfaces and its elastic ring.

4,224,166

DRUM FILTER AND METHOD

Floyd H. Wyman, Greenville, S.C., assignor to Marshall and Williams Company, Greenville, S.C.

Filed Jul. 11, 1978, Ser. No. 923,706
Int. Cl.[2] B01D *33/36*
U.S. Cl. 210—396 **14 Claims**



1. In filter having a perforate drum rotatable about a longitudinal axis with liquid filter media carried internally of the drum conforming thereto for retaining solids within the drum while the filtered liquid passes through the drum, the improvement comprising:

longitudinal scoop means extending transversely within said drum for collecting solids from liquid in said drum and carrying the solids upwardly from the liquid;

conveyor means extending longitudinally within the drum carried above the liquid for removing solids from the drum; and

means retracting said scoop means for discharging solids collected thereby onto said transverse conveyor means.

4,224,167

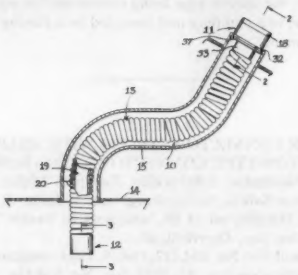
FILLER TUBE AND FILTER ATTACHMENT UNIT FOR FUEL

Philip Buttigieg, 1612 York Ave., New York, N.Y. 10028

Filed Mar. 19, 1979, Ser. No. 22,088
Int. Cl.[2] B01D *29/10*
U.S. Cl. 210—460 **6 Claims**

1. A filler tube and filter unit for attachment to a filler pipe and liquid-fuel storage tank in communication therewith and adapted for vehicular engine and other equipment use, comprising as one component an imperforate flexible hose of a shatter-proof material of construction adapted to be insertable within and concentrically disposed along said filler pipe and terminating within said liquid-fuel storage tank, said flexible hose along the length thereof having continuous and smooth-surfaced inner walls and said filler pipe serving as a protective housing for said flexible hose, a second component comprising attaching means with a closure cap therefor and secured to and communicating with the upper end of the said hose for engagement with the mouth of the filler pipe whereby said hose serves as the sole conduit for flow of fuel from the source or pump to the fuel tank, and filtering means as a third component for the fuel and being secured to and communicating with the lower end of the said hose; said filtering means being of a predetermined permeability sufficient to prevent sudden back-surge of fuel from said fuel tank.

5. A filler tube and filter unit for attachment to the mouth of a filler pipe and concentrically disposed therein and extending into the liquid-fuel storage tank in communication with said filler pipe and adapted for vehicular engine and other equip-



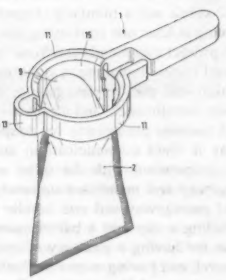
ment use, comprising as one component an imperforate flexible hose of a shatterproof material of construction having means at the upper end for detachable engagement with the mouth of the filler pipe and further means for detachable engagement with a closure cap, said flexible hose along the length thereof having continuous and smooth-surfaced inner walls and said filler pipe serving as a protective shell for said flexible hose, a filter assembly as the second component comprising a housing disengagably secured to the lower end of the said hose and in communication therewith, said housing having mounted within and thereacross a filter element of predetermined permeability sufficient to prevent sudden back-surge of liquid-fuel from said storge tank.

4,224,168

HOLDER FOR FILTER BAGS

Jan Trägårdh, Copenhagen, Denmark, assignor to Teafilter International A/PS, Copenhagen, Denmark

Filed Nov. 20, 1978, Ser. No. 962,091
Int. Cl.[2] B01D *23/00*
U.S. Cl. 210—470 **8 Claims**



1. A holder of elastic material for filter bags open at one end for preparing beverages, especially tea and coffee, which includes: a tubular stud for receiving and holding a filter bag, said stud having an upper part with radially outwardly extend-

ing means for resting on the opening rim of a vessel intended to receive the beverage and for limiting the slipping-on movement of the filter bag onto said stud, said tubular stud also having a lower part connected to said upper part and provided with an axial slot therethrough dividing said lower part into two sections, the lower end of said two sections respectively comprising two end surfaces inclined relative to the longitudinal axis of said stud so as to define with each other a wedge-shaped end region facilitating the slipping of a filter bag onto said stud, and resilient actuating means operable selectively to move said two sections toward each other against the resilient force thereof to facilitate the slipping of a filter bag onto said stud and subsequently to allow the resilient force of said resilient actuating means to spread said sections apart so as to cause said sections to hold a slipped-on filter bag on said stud.

4,224,169
FLAME RETARDANT COMPOSITIONS AND METHOD OF PREPARING SAME

Alfonso G. Retana, Mexico City, Mexico, assignor to Promotora de Tecnologia Industrial, S.A., Mexico City, Mexico

Filed Oct. 19, 1978, Ser. No. 952,906
Int. Cl.[3] C09K *3/28*
U.S. Cl. 252—8.1 **9 Claims**

1. A composition for imparting flame retardancy to flammable materials comprising the following ingredients in the approximate amounts indicated:

Compound No.		
1	Triethanolamine Lauryl Sulphate	0.5–6.0% by Volume (5–6 ml/l)
2	Ammonium Iodide	2.0–7.0 parts by weight (PBW)
3	Ammonium Monophosphate	1.5–8.0 PBW
4	Ammonium Bromide	2.0–12.0 PBW
5	Borax or Sodium Tetraborate	1.5–20.0 PBW
6	Boric Acid	1.5–7.0 PBW
7	Ammonium Sulphate	3.5–20.0 PBW
8	Sodium Silicate	0.1–1.0% by volume (1–10 ml/l)
9	1,2 Propylene Glycol	1.5–10.0% by volume (15–100 ml/l)
10	Water	to make one liter

4,224,170
RUST INHIBITING ADDITIVE COMPOSITIONS FOR OILS

Haakon Haugen, Oslo, Norway, assignor to Texaco Inc., White Plains, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,305
Int. Cl.[2] C10M *1/48, 1/40, 1/32, 3/42*
U.S. Cl. 252—32.7 E **12 Claims**

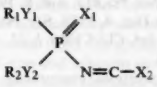
1. A composition useful as a rust inhibiting additive for oils comprising a first admixture of calcium hydroxide overbased oil-soluble calcium sulfonate, hexylene glycol and a surfactant consisting of an ethoxylated aliphatic amine, and a second oil-soluble admixture comprising the zinc salt of the reaction product of an alcohol mixture, and phosphorus pentasulfide, in the proportion of about 5 moles of said alcohol mixture to 1 mole of said phosphorus pentasulfide, said alcohol mixture consisting of about 2.7 moles of a mixture consisting of about 50% primary heptanols, 20% secondary heptanols, 10% hexanols, 10% octanols, 5% butanols and 5% minor components and 2.3 moles of isopropanol, to form a dialkyldithiophosphonic acid and reacting said dialkyldithiophosphonic acid with an excess of zinc oxide to form said zinc salt, a mono(beta-hydroxyethyl) alkene thiophosphonate and a calcium carbonate overbased calcium sulfonate dissolved or dispersed in a solvent refined lubricating oil, said second admixture containing about 4.0% by weight sulfur, 3.6% by weight calcium, 2.1% by weight zinc and 2.4% by weight phosphorus.

4,224,171
NOVEL LUBRICANT ADDITIVES CONTAINING PHOSPHORUS AND NITROGEN AND LUBRICANT COMPOSITIONS CONTAINING THEM

Georges Rivier, Bron, and Gerard Forat, Lyons, both of France, assignors to Orogil, Couroevoie, France

Filed Oct. 23, 1978, Ser. No. 953,884
Claims priority, application France, Nov. 2, 1977, 77 32857
Int. Cl.[2] C10M *1/48*
U.S. Cl. 252—46.7 **11 Claims**

1. A lubricant composition comprising a major proportion of an oil of lubricating viscosity and containing from about 0.2 to 10 percent by weight of a lubricant additive comprising a derivative of a compound selected from the class consisting of isocyanates and isothiocyanates of the formula:



in which formula Y_1, Y_2, X_1 and X_2 are members selected from the class consisting of oxygen and sulfur atoms, and R_1 and R_2 represent hydrocarbon groups; with a nitrogen-containing compound having at least one

radical, wherein the two remaining values of the

radical of said nitrogen compound are satisfied by a member selected from the class consisting of:

hydrogen;
an alkyl radical of C_1–C_{24};
an alkenyl radical of C_3–C_{24};
an alkynyl radical of C_3–C_{16};
a cycloalkyl radical of C_5–C_{12};
a polycycloalkyl radical of C_9–C_{18};
a phenyl radical;
a nitrogen-containing heterocyclic radical;
a nitrogen-containing heterocyclic radical also containing other hetero-elements; and
organic radicals forming with said nitrogen atom a nitrogen-containing heterocycle.

8. A lubricant composition comprising a major proportion of an oil of lubricating viscosity and containing from about 0.2 to 10 percent by weight of a lubricant additive according to claim **1**, wherein the said nitrogen compound is selected from among:

ammonia;
C_3–C_{12} alkylmonoamines;
C_3–C_{12} hydroxymonoamines;
C_2–C_{12} alkyl diamines;
a polyalkylene polyamine;
tris(3-oxa-6-amino-hexyl)amine;
alkenylsuccinimides derived from polyamines and the alkenyl radical of which has more than 30 carbon atoms;
alkenyl amines whose alkenyl radical has more than 20 carbon atoms;
γ-aminopropyltriethoxysilane;
cyclohexylamine;
aniline;
o-aminophenol;
m-trifluoromethylaniline;

mercaptotrifluoromethylaniline;
N(2-butyl pentyl)N'(phenylene diamine);
3-amino-1,2,3-triazole;
2-amino-benzothiazole;
2-aminobenzimidazole;
5-amino-2-mercapto-1,3,4-thiadiazole;
morpholine.

4,224,172

OIL-SOLUBLE ADDUCTS OF BENZOTRIAZOLE AND OXAZOLINES AND LUBRICANT COMPOSITIONS CONTAINING SAME

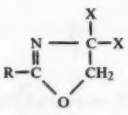
Kirk D. Schmitt, and Robert F. Bridger, both of Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 785,813, Apr. 8, 1977, abandoned. This application Dec. 4, 1978, Ser. No. 965,819

Int. Cl.[2] C10M *1/32*

U.S. Cl. 252—51.5 R **14 Claims**

1. Lubricant compositions comprising oils of lubricating viscosity or greases prepared therefrom and containing a minor amount, sufficient to impart anticorrosion properties thereto, of an oil-soluble adduct of benzotriazole and an oxazoline of the structure



wherein R is an alkyl, alkenyl or cycloalkyl radical having from about 6 to about 20 carbon atoms, or where R is derived from a suitable carboxylic acid or a mixture of such acids and X is hydrogen, methyl, hydroxymethyl or alkyl of from 2 to about 20 carbon atoms.

4,224,173

LUBRICANT OIL CONTAINING POLYTETRAFLUOROETHYLENE AND FLUOROCHEMICAL SURFACTANT

Franklin G. Reick, 228 West Pl., Westwood, N.J. 07675, assignor to Michael Ebert, Mamaroneck, N.Y., a part interest

Division of Ser. No. 809,805, Jun. 24, 1977, Pat. No. 4,127,491, which is a continuation-in-part of Ser. No. 708,222, Jul. 23, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,908

Int. Cl.[2] C10M *1/30, 1/20, 3/24, 3/14*

U.S. Cl. 252—52 A **5 Claims**

1. A lubricant for use in the crankcase of an internal combustion engine and in similar applications, said lubricant comprising:

(A) lubricating oil providing a working lubricant applicable to the metal rubbing surfaces of the engine, said oil having particles of polytetrafluoroethylene dispersed therein to enhance its lubricating characteristics; and

(B) a fluorochemical-surfactant to stabilize the dispersion to prevent agglomeration of the particles, the amount of said surfactant being an excess of that necessary to stabilize the dispersion to a degree creating a molecular surface tension skin on the surface of the lubricating oil to reduce volatilization losses of the oil when the lubricant is heated to a high temperature in the course of engine operation.

4,224,174

PIEZOELECTRIC OXIDE MATERIALS

Hideo Okuma, Kawasaki; Takashi Takahashi, Tokyo; Yohachi Yamashita, and Osamu Furukawa, both of Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Dec. 29, 1978, Ser. No. 974,545

Claims priority, application Japan, Dec. 29, 1977, 53-158930

Int. Cl.[2] C04B *35/46*

U.S. Cl. 252—62.9 **4 Claims**

1. A piezoelectric oxide material, having a general formula:

$$(1-x)PbTiO_3\text{-}xPb(Co_{\frac{1}{3}}W_{\frac{1}{3}})O_3$$

where, "x" ranges between 0.01 and 0.10, and 0.5 to 20 atomic % of Pb is replaced by at least one element selected from the group consisting of Ba, Sr and Ca.

4,224,175

PROCESS FOR THE PREPARATION OF MAGNETIC POWDERS BASED ON γ-FE_2O_3

Franco Montino, Casale Monferrato; Ariello R. Corradi, Ospitaletto, and Erminio Nonato, Torrion Quartara, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Apr. 13, 1979, Ser. No. 29,937

Claims priority, application Italy, Apr. 17, 1978, 22367 A/78; Mar. 7, 1979, 20795 A/79

Int. Cl.[2] C01G *49/06*

U.S. Cl. 252—62.56 **4 Claims**

1. A process for preparing acicular magnetic particles consisting essentially of γ-Fe_2O_3 modified with Fe^{2+} and Co^{2+} ions, by treating hydrothermally, and in the presence of an alkali, a suspension of acicular γ-Fe_2O_3 in an aqueous solution of soluble Fe^{2+} and Co^{2+} salts, characterized in that as an alkali there is used NH_3 in such a quantity that the molar ratio

$$NH_3/(Fe^{++}+Co^{++})$$

is between 2.1 and 2.3; that the molar ratio Fe^{++}/Co^{++} in said solution is between 2 and 3; that the treatment is conducted at a temperature between 140° C. and 180° C.; and that when the molar ratio Fe^{++}/Co^{++} is greater than about 2.5 the process is conducted in the presence of oxygen or of an oxygen-containing gas, the quantity of oxygen not exceeding 28% of the stoichiometric amount required for oxidizing all the ferrous iron to the ferric state, while, when the ratio Fe^{++}/Co^{++} is less than or equal to about 2.5, the process is conducted either in the absence or in the presence of oxygen or of an oxygen-containing gas, the quantity of oxygen in that event being between 0% and 28% with respect to the above-defined stoichiometric amount.

4,224,176

USE OF 2-OXABICYCLOOCTANE DERIVATIVES IN AUGMENTING OR ENHANCING THE AROMA OF DETERGENTS

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 12,695, Feb. 16, 1979, Pat. No. 4,195,100, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978, Pat. No. 4,195,099. This application Jun. 15, 1979, Ser. No. 48,908

Int. Cl.[2] C11D *3/50, 9/44*

U.S. Cl. 252—174.11 **2 Claims**

1. A process for augmenting or enhancing the aroma of a detergent comprising the step of intimately admixing with a solid or liquid detergent base from 0.01% up to 0.5% by weight of said detergent of an oxabicyclooctane derivative selected from the group consisting of:

(i) 3-ethyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane;

(ii) 3-n-butyl-1,4-dimethyl-2-oxabicyclo[2.2.2]octane;
(iii) 3-isopropyl-1,5-dimethyl-2-oxabicyclo[2.2.2]octane;
(iv) 3-n-butyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane;
(v) 5-ethyl-1,5-dimethyl-3-n-propyl-2-oxabicyclo [2.2.2]octane;
(vi) 3-methallyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane; and
(vii) 3-isopropyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane.

4,224,177

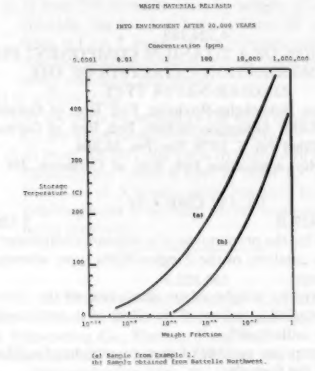
FIXATION OF RADIOACTIVE MATERIALS IN A GLASS MATRIX

Pedro B. Macedo, 6100 Highboro Dr., Bethesda, Md. 20034; Joseph H. Simmons, Potomac, and Theodore A. Litovitz, Silver Spring, both of Md., assignors to Pedro B. Macedo, Bethesda and Theodore A. Litovitz, Silver Spring, both of, Md.

Continuation-in-part of Ser. No. 836,778, Sep. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 784,437, Apr. 4, 1977, abandoned. This application Mar. 9, 1978, Ser. No. 884,371

Int. Cl.[2] G21F *9/16*

U.S. Cl. 252—301.1 W **22 Claims**



1. A non-porous glass composition containing radioactive materials encapsulated and immobilized in the glass matrix, said composition bein characterized by: (a) containing and at least 75 mol percent SiO_2, (b) having a radiation activity above one millicurie per cubic centimeter of said composition, (c) having high chemical durability to aqueous solution, and (d) containing immobilized oxides of said radioactive material chemically incoporated into the silica structure thereof whereby leakage of said oxides of the radioactive components to the environment at environmental temperature is prevented for extremely long periods of time.

16. A method of preventing the dissemination of radioactive material selected from the group of normally radioactive gases and volatilizable materials which yield radioactive gases which comprises (a) impregnating the pores of a porous glass preform with a dopant to increase the surface are thereof, said preform being characterized by an interconnected porous structure and a SiO_2 content of at least 75 mol percent, (b) removing said dopant from the surface of the preform to thus product a skin or outer clad which is substantially free of said dopant and an inner code region containing substantial quantities of dopant therein; (c) drying said preform; (d) impregnating the pores of the dried preform with the abovesaid radioactive material; (e) heating said preform to sintering temperature to collapse the porous structure of the preform thereby encapsulating and immobilizing the radioactive material in the glass matrix.

4,224,178

METHOD FOR REDUCING THE CRYSTALLINITY OF A STABILIZED COLLOIDAL COMPOSITION

Nathan Feldstein, 63 Hemlock Cir., Princeton, N.J. 08540

Continuation-in-part of Ser. No. 758,084, Jan. 7, 1977, abandoned, which is a continuation-in-part of Ser. No. 625,326, Oct. 23, 1975, Pat. No. 4,048,354. This application Jul. 24, 1978, Ser. No. 927,467

The portion of the term of this patent subsequent to Sep. 13, 1994, has been disclaimed.

Int. Cl.[3] B01J *13/00*

U.S. Cl. 252—313 R **3 Claims**

1. A method for reducing the crystallinity of a stabilized colloidal composition by the steps of admixing a modifier with said stabilized colloidal composition and causing the formation of a relatively amorphous colloidal dispersion and further wherein said stabilized colloidal dispersion or otherwise the crystalline colloidal composition is nucleated in the presence of a colloidal stabilizer and wherein the addition of said modifier does not change the oxidation state of any metal(s) constituting the colloid nucleus and wherein said amorphous colloid consists of metals selected from the group consisting of copper, nickel, cobalt and iron and wherein said metal may be part of an alloy, a compound or an elemental state and combinations thereof and wherein said modifier is a surfactant.

2. A method for reducing the crystallinity of a stabilized colloidal composition by the steps of admixing a modifier with said stabilized colloidal composition and causing the formation of a relatively amorphous colloidal dispersion and further wherein said stabilized colloidal dispersion or otherwise the crystalline colloidal composition is nucleated in the presence of a colloidal stabilizer and wherein the addition of said modifier does not change the oxidation state of any metal(s) constituting the colloid nucleus and wherein said modifier is selected from the group of soluble alkylsulfates.

4,224,179

PROCESS FOR THE PREPARATION OF LIPOSOMES IN AQUEOUS SOLUTION

Michel Schneider, Geneva, Switzerland, assignor to Battelle Memorial Institute, Carouge-Geneva, Switzerland

Filed Aug. 4, 1978, Ser. No. 931,242

Claims priority, application Switzerland, Aug. 5, 1977, 9616/77

Int. Cl.[2] B01J *13/02*

U.S. Cl. 252—316 **19 Claims**

1. In a process for the preparation of a solution or suspension of liposomes in an aqueous medium in which a non-aqueous dispersion of liposome precursors is first produced by dispersing a first aqueous liquid in an essentially water-insoluble solvent in the presence of a compound of the formula XY wherein X is a hydrophilic lipophobic group and Y is a lipophilic hyrophobic group, said liposome precursors consisting of small vesicles of the first aqueous liquid surrounded by a monomolecular film of compound XY, the improvement comprising thereafter emulsifying the liposome precursors in said aqueous medium in the presence of a compound of the formula ZW wherein Z is a hydophilic group and W is a hydophobic group to thereby form a solution or suspension of liposomes consisting of the first aqueous liquid surrounded by a bimolecular film of structure XY-WZ, and water-insoluble solvent being removed prior to or after said emulsification.

4,224,180

COLD END ADDITIVE COMPOSITIONS

Richard J. Sujdak, Morrisville, Pa., assignor to Betz Laboratories, Inc., Trevose, Pa.

Continuation-in-part of Ser. No. 19,686, Mar. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 950,960, Oct. 13, 1978, Pat. No. 4,185,071. This application Oct. 30, 1979, Ser. No. 89,680

Int. Cl.[3] **C23F** *11/00, 11/02*

U.S. Cl. 252—392 **5 Claims**

1. A cold-end additive composition for reducing the amount of sulfuric acid corrosion of metal parts at the cold-end of a combustion system in contact with combustion gases derived from the combustion of sulfur-containing fuel, said composition comprising in combination:

(i) aliphatic, water-soluble alkanolamine, and

(ii) ethylene polyamine, wherein the weight ratio of alkanolamine to ethylene polyamine is 25:1 or less.

4,224,181

ZIEGLER TYPE CATALYST SYSTEM

Arthur W. Langer, Jr., Watchung, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 862,290, Dec. 19, 1977, abandoned, which is a division of Ser. No. 767,766, Feb. 11, 1977, Pat. No. 4,094,818. This application Mar. 7, 1979, Ser. No. 18,418

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.[2] **C08F** *4/62, 4/64, 4/68, 4/70*

U.S. Cl. 252—429 B **16 Claims**

1. A catalyst composition which comprises a mixture of:

(a) at least one supported Group IVB to VIII transition metal halide;

(b) a trialkyl metal cocatalyst, said trialkyl metal cocatalyst having the structure of R'_3Y wherein R' is selected from the group consisting of C_1 to C_{20} primary alkyl, secondary alkyl, tertiary alkyl, neopentyl alkyl, branched alkyl, naphthenic or aralkyl groups and Y is selected from the group consisting of aluminum, gallium and indium;

(c) a nitrogen-containing metal alkyl compound, the structure of said nitrogen-containing metal alkyl compound being selected from the group consisting of

$$R'_2YNR_2$$

or

$$R'XYNR_2$$

wherein Y is selected from the group consisting of Al, Ga and In, X is a halide and R' is a C_1 to C_{20} primary alkyl, secondary alkyl, tertiary alkyl, neopentyl alkyl, branched alkyl, naphthenic or aralkyl group and R is selected from the group consisting of C_3 to C_{20} bulky alkyl, cycloalkyl, aryl, the proviso that the two R groups can be taken with N to form a pyrrolidyl or piperidyl and the alkyl substituted derivatives of pyrrolidyl and piperidyl, said compound being in a mole ratio of about 0.5 to about 200 of said compound to said transition metal compound, and

(d) at least one Lewis base said Lewis base not causing excessive cleavage of metal-carbon bonds or loss of active sites.

4,224,182

NOVEL HINDERED ALKYL ALUMINUM AMIDE COCATALYSTS

Arthur W. Langer, Jr., Watchung; John J. Steger, Scotch Plains, and Terry J. Burkhardt, Cranford, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 7, 1979, Ser. No. 18,188

Int. Cl.[2] **C08F** *4/64*

U.S. Cl. 252—429 B **20 Claims**

1. A catalyst composition which comprises:

(a) a supported Group IVB-VIII transition metal halide;

(b) an alkyl metal amide compound having the formula R'_2YNR_2 wherein R' is selected from the group consisting of C_1 to C_{20} primary alkyl, secondary alkyl, tertiary alkyl, neopentyl alkyl, branched alkyl, naphthenic and aralkyl groups, R is selected from the group consisting of C_4 to C_{20} bulky alkyl, aralkyl, aryl and substituted aryl groups, said aryl groups being substituted with at least one alkyl, chloro or methoxy group and a hindered cyclic amide group, wherein both R groups are taken together to form said hindered cyclic amide group, and Y is selected from the group consisting of aluminum, gallium and indium; and

(c) at least one Lewis base which does not cause excessive cleavage of metal-carbon bonds or loss of active sites.

4,224,183

PREPARATION OF A TITANIUM COMPONENT FOR POLYMERIZATION CATALYSTS OF THE ZIEGLER-NATTA TYPE

Gerhard Staiger, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 5, 1979, Ser. No. 54,864

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1978, 2830929

Int. Cl.[2] **C08F** *4/64*

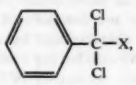
U.S. Cl. 252—429 B **1 Claim**

1. A process for the preparation of a titanium component for polymerization catalysts of the Ziegler-Natta type, wherein

(1) in a first stage

(1.1) 100 parts by weight of an alcoholate of the general formula $Mg(OR)_2$, where R is alkyl of 1 to 6 carbon atoms, are milled with

(1.2) the appropriate number of parts by weight of a chlorotoluene of the formula



where X is chlorine or hydrogen, to correspond to a molar ratio of alcoholate (1.1):chlorine in the chlorotoluene (1.2) of from 100:1 to 100:100 in a vibratory ball mill under a milling acceleration of from 30 to 80 $m \times sec^{-2}$ for a period of from 5 to 100 hours at from $-50°$ to $+10°$ C. in the absence of a diluent, thereafter

(2) in a second stage

(2.1) 100 parts by weight of the material resulting from stage (1) and

(2.2) from 300 to 1,800 parts by weight of titanium tetrachloride are brought together, the batch is kept for from 0.1 to 5 hours at from 40° to 180° C., with constant mixing, and the resulting solid is isolated, excess titanium tetrachloride being separated off, and finally

(3) in a third stage

(3.1) 100 parts by weight of the solid resulting from stage (2) are again brought together with

(3.2) from 300 to 1,800 parts by weight of titanium tetrachloride, the batch is kept for from 0.1 to 5 hours at from 40 to 180° C., with constant mixing, and the resulting solid is isolated, excess titanium tetrachloride being separated off.

4,224,184

PREPARATION OF A COMPONENT FOR POLYMERIZATION CATALYSTS

Gerhard Staiger, Bobenheim-Roxheim, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,087

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1978, 2831830

Int. Cl.[2] C08F *4/64*

U.S. Cl. 252—429 B 1 Claim

1. A process for the preparation of a titanium component for polymerization catalysts of the Ziegler-Natta type, wherein

(1) in a first stage

(1.1) 100 parts by weight of an alcoholate of the general formula $Mg(OR)_2$, where R is alkyl of 1 to 6 carbon atoms, are milled with

(1.2) such parts by weight of benzoyl chloride as correspond to a molar ratio of alcoholate (1.1): benzoyl chloride (1.2) of from 100:5 to 100:100, in a vibratory ball mill with a milling acceleration of from 30 to 80 $m.sec^{-2}$ for a period of from 2 to 100 hours at from −50° to +10° C. in the absence of a diluent, thereafter

(2) in a second stage

(2.1) 100 parts by weight of the material resulting from stage (1) are brought together with

(2.2) from 300 to 1,800 parts by weight of titanium tetrachloride, the batch is kept at from 40° to 180° C. for from 0.1 to 5 hours, with constant mixing, and the resulting solid is isolated, excess titanium tetrachloride being removed, and finally

(3) in a third stage

(3.1) 100 parts by weight of the solid resulting from stage (2) are again brought together with

(3.2) from 300 to 1,800 parts by weight of titanium tetrachloride, the batch is kept at from 40° to 180° C. for from 0.1 to 5 hours, with constant mixing, and the resulting solid is isolated, excess titanium tetrachloride being removed.

4,224,185

SHAPING AND SIZING OF CATALYSTS

Harry J. Wristers, Baytown, Tex., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 811,508, Jun. 30, 1977, abandoned. This application Mar. 26, 1979, Ser. No. 24,216

Int. Cl.[2] C08F *4/64;* B01J *31/06*

U.S. Cl. 252—429 B 12 Claims

1. A method for forming shaped, solid catalysts which comprises the steps of mixing solid catalyst particles with a fibrillatable polyolefin; mechanically shearing the mixture to form a mat of catalyst particles entrapped in a fibrous network of the polyolefin, and mechanically shaping the mat to a plurality of particles of predetermined shape and size to provide shaped catalyst particles of uniform size.

4,224,186

HIGH EFFICIENCY CATALYST FOR POLYMERIZING OLEFINS

Kirby Lowery, Jr., Lake Jackson; Donald F. Birkelbach, Angleton, and Randall S. Shipley, Alvin, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 939,632, Sep. 5, 1978, abandoned. This application Apr. 9, 1979, Ser. No. 27,974

Int. Cl.[2] C08F *4/58, 4/64*

U.S. Cl. 252—429 C 9 Claims

1. In a catalytic reaction product of (A) a tetravalent titanium compound, (B) an organoaluminum compound, (C) an organomagnesium component and (D) a halide source; said catalytic reaction product having atomic ratios of

Mg:Ti is from about 1:1 to about 2000:1;

Al:Ti is from about 0.1:1 to about 2000:1;

excess X:Al is from about 0.0005:1 to about 10:1; the improvement which comprises employing as the halide source in said catalyst a tetravalent tin halide represented by the formula SnX_aR_{4-a}, wherein X is a halogen, R is a hydrocarbyl or hydrocarbyloxy group and a has a value of 1 to 4 and the atomic ratio of Sn:Mg is from about 0.01:1 to about 500:1.

4,224,187

OLEFIN OXIDATION CATALYST AND PROCESS FOR ITS PREPARATION

Thomas H. Vanderspurt, Homestead Park, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,201

Int. Cl.[2] B01J *23/78, 23/84, 23/88, 27/18*

U.S. Cl. 252—437 6 Claims

1. A process for preparing an oxidation catalyst corresponding to the formula:

$$Mo_{12}Co_{1\text{-}7}Fe_{1\text{-}6}Ni_{1\text{-}6}Bi_{0.3\text{-}3}L_{0.55\text{-}2}M_{0.3\text{-}0.6}O_x$$

wherein Mo, Co, Fe, Ni, Bi and O are respectively the elements of molybdenum, cobalt, iron, nickel, bismuth and oxygen; L is at least one element selected from potassium and rubidium; M is at least one element selected from phosphorus, cerium, germanium, manganese, niobium, antimony and tantalum; and x represents the number of oxygen atoms between about 35 and 75 sufficient to satisfy the valence requirements of the other elements; said process consisting essentially of the steps of (1) admixing and slurrying in an aqueous medium respectively compounds of Mo, Co, Fe, Ni, Bi, L and M which are at least partially water-soluble, (2) adjusting the final pH of the aqueous slurry admixture within the range between about 1–5, (3) concentrating the aqueous slurry admixture by water removal to yield a catalyst coprecipitate, (4) heating the catalyst coprecipitate at a temperature in the range between about 200°–250° C. in the presence of molecular oxygen, and (5) calcining the catalyst composition at a temperature between about 400°–600° C. in the presence of molecular oxygen.

4,224,188

ALUMINUM FAUJASITES, CATALYST CONTAINING SAME AND PROCESS OF PRODUCING SAME

Hamid Alafandi, Woodland Hills, and Dennis Stamires, Newport Beach, both of Calif., assignors to Filtrol Corporation, Los Angeles, Calif.

Filed Mar. 13, 1978, Ser. No. 886,077

Int. Cl.[3] B01J *29/08;* C01B *33/28*

U.S. Cl. 252—455 Z 14 Claims

1. The aluminum exchanged zeolite of the faujasite type which is produced by treating a sodium zeolite of the faujasite type with an aluminum salt solution to form a zeolite containing Na in exchange position in amount less than about 6% expressed as Na_2O on a volatile free basis and then further exchanging the said treated zeolite with a salt of a monovalent or polyvalent cation other than aluminum and further reducing the sodium cation in the exchanged zeolite.

4,224,189

PROCESS OF PREPARING A POROUS, PURE SILICA

Joseph J. F. Scholten, Sittard, and Lambertus J. M. A. Van de Leemput, Echt, both of Netherlands, assignors to Stamicarbon, B.V., Geleen, Netherlands

Filed Jul. 14, 1978, Ser. No. 924,747

Claims priority, application Netherlands, Jul. 18, 1977, 7707960

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.[2] B01J *29/00;* C01B *33/12*

U.S. Cl. 252—458 9 Claims

1. Process for preparing a porous, pure silica with a pore volume of at least about 1.0 cm^3/gram with a sodium content of at most about 200 ppm, comprising the steps of

(a) admixing to a non-porous silica prepared by the flame hydrolysis of a silicon-halogen compound at least about 50% by weight of water per weight of water plus silica,
(b) forming a silica gel from said admixture of non-porous silica and water,
(c) heating said gel at a temperature between about 200° C. to about 1000° C. to dry the gel, and
(d) grinding the dried silica to a particle size of at least about 10 microns.

9. The supported chromium-oxide catalyst having as the support a porous, pure silica with a pore volume of at least about 1.0 cm^3/gram and a sodium content of at most about 200 ppm prepared by the process comprising the steps of
(a) admixing to a non-porous silica prepared by the flame hydrolysis of a silicon-halogen compound at least about 50% by weight of water per weight of water plus silica,
(b) forming a silica gel from said admixture of non-porous silica and water,
(c) heating said gel at a temperature between about 200° C. to about 1000° C. to dry the gel,
(d) grinding the dried silica to a particle size of at least about 10 microns to form a catalyst support,
(e) placing a chromium compound on said support, and
(f) heating the supported chromium compound in a non-reducing atmosphere to form a supported chromium-oxide catalyst.

4,224,190

CATALYST FOR DEHYDROGENATING ORGANIC COMPOUNDS, IN PARTICULAR AMINES, THIOLS, AND ALCOHOLS, AND A PROCESS FOR ITS PREPARATION

John Villadsen; Hans Livbjerg, and Carl E. Moller, all of Bygning 229, 2800 Lyngby, Denmark

Filed Jul. 19, 1978, Ser. No. 925,930
Claims priority, application Denmark, Jul. 22, 1977, 3315/77
Int. Cl.[2] B01J *23/08, 23/06*
U.S. Cl. 252—463 **7 Claims**

1. A catalyst for dehydrogenating an organic compound reactant in the gaseous phase comprising a solid state carrier material having a porosity of from about 0.2 to 0.7 cm^3/cm^3, and an active catalytic metal selected from the group consisting of indium and zinc within the pores of said carrier, said catalytic metal being in the liquid state at the reaction temperature of the gaseous reactant and forming droplets having diameters ranging from about 0.3 to 2.0 microns, said droplets being encased in pores forming cavities having diameters greater than the diameters of the respective droplets therein contained, said cavities being interconnected to other pores having diameters less than the diameters of the metal droplets and forming a system of interconnected ducts connecting the external surface of the carrier with the surfaces of the metal droplets, and said carrier material having a contact angle of more than 90° in contacting the liquid metal droplets.

5. A process for preparing a catalyst for dehydrogenating organic compounds comprising mixing a powdered source of an active catalytic metal selected from the group consisting of In_2O_3 and ZnO with a carrier material selected from the group consisting of oxides and hydroxides of Mg, Al, Si, Ca, Ti, Cr, Zn, W and mixtures thereof, firing the resulting mixture at a temperature of from about 900° to 1150° C. for about 5 to 20 hours, activating the catalyst by subjecting the same at a temperature of from about 320° to 440° C. to contact with a gas selected from the group consisting of reducing gases and an organic compound to be dehydrogenated, until 2 to 3 times the calculated stoichiometric amount of gas for complete reduction of In_2O_3 to In or ZnO to Zn respectively has passed through the catalyst.

7. A process according to claim 5, wherein powdered In_2O_3 is mixed with an aqueous $Mg(OH)_2$ gel while grinding to form a paste containing In_2O_3 granules under 5u in size uniformly dispersed in the $Mg(OH)_2$ gel, drying the paste at about 100° to 150° C. to a dryness of from about 40 to 60% and extruding the so dried product before firing the same.

4,224,191

HIGH-COPPER-LEVEL COMULLED SULFUR SORBENT

Keith C. Bishop, III, San Rafael, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Mar. 5, 1979, Ser. No. 17,782
Int. Cl.[2] B01J *21/04, 23/72*
U.S. Cl. 252—463 **9 Claims**

1. A porous sulfur sorbent, prepared by the process which comprises:
peptizing an alumina with acid; mulling the peptized alumina with a copper compound to form an extrudable dough; extruding the dough; and drying and calcining the extrudate.

4,224,192

METHOD FOR PREPARING A MODIFIED ALUMINA CATALYST SUPPORT AND A COMPOSITION COMPRISING SAID SUPPORT AND A CATALYST

Alan I. Foster, Ashford; John J. McCarroll, Camberley, and Stephen R. Tennison, Weybridge, all of England, assignors to The British Petroleum Company Limited, Sunbury on Thames, United Kingdom

Filed Dec. 26, 1978, Ser. No. 972,913
Claims priority, application United Kingdom, Jan. 17, 1978, 01769/78
Int. Cl.[3] B01J *21/04, 23/40, 23/74*
U.S. Cl. 252—466 B **4 Claims**

1. A method for preparing a modified alumina catalyst support which method comprises the steps of mixing a Solution A containing alkali, a Solution B containing a salt of a modifying metal of Group IIIA other than aluminium, of the Periodic Table, and a Solution C containing an aluminium salt to form a precipitate, ageing the precipitate, separating the precipitate from the supernatant liquor and calcining the precipitate.

4,224,193

OLEFIN OXIDATION CATALYST AND PROCESS FOR ITS PREPARATION

Thomas H. Vanderspurt, Homestead Park, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,202
Int. Cl.[2] B01J *23/78, 23/80, 23/84, 23/88*
U.S. Cl. 252—468 **5 Claims**

1. A process for preparing an oxidation catalyst corresponding to the formula:

$$Mo_{12}Ni_{5-7}Bi_{1-3}Co_{1-3}Fe_{1-3}Sb_{1-3}Zn_{0.3-0.8}M_{0.4-2}O_x$$

wherein Mo, Ni, Bi, Co, Fe, Sb, Zn and O are respectively the elements of molybdenum, nickel, bismuth, cobalt, iron, antimony, zinc and oxygen; M is at least one element selected from potassium and rubidium; and x represents the number of oxygen atoms between about 35 and 75 sufficient to satisfy the valence requirements of the other elements; said process consisting essentially of the steps of (1) admixing and slurrying in an aqueous medium respectively compounds of Mo, Co, Ni, Bi, Fe, Sb, Zn and M which are at least partially water-soluble, (2) adjusting the final pH of the aqueous slurry admixture within the range between about 1–5, (3) concentrating the aqueous slurry admixture by water removal to yield a catalyst coprecipitate, (4) heating the catalyst coprecipitate at a temperature in the range between about 200°–250° C. in the presence of molecular oxygen, and (5) calcining the catalyst composition at a temperature between about 400°–600° C. in the presence of molecular oxygen.

4,224,194

PROCESS FOR PREPARING AN ETHYLENE OXIDE CATALYST

Stanley B. Cavitt, Austin, Tex., assignor to Texaco Development Corp., White Plains, N.Y.

Filed Feb. 26, 1979, Ser. No. 15,509
Int. Cl.[2] B01J 23/50
U.S. Cl. 252—476 26 Claims

1. A process for preparing an activated silver catalyst for the vapor phase epoxidation of ethylene with an oxygen-containing gas which comprises:

contacting a porous, inorganic, catalyst support material with an impregnating solution; and,

heating the impregnated support material at temperatures from about 50° C. to 300° C. to evaporate volatiles and activate said catalyst,

wherein said impregnating solution comprises:

(a) a silver salt,

(b) an organic amine solubilizing/reducing agent,

(c) a perchlorate salt of a higher alkali metal selected from the group consisting of cesium, rubidium and mixtures thereof sufficient to deposit on the said support an effective amount of the said higher alkali metal,

(d) an aqueous solvent, and

(e) a perhalogenated acid selected from the group consisting of perchloric acid, periodic acid, perbromic acid and mixtures thereof in an amount of from 0.5 to 20 milliequivalent weights per milliequivalent weight of the perchlorate salt in the said solution.

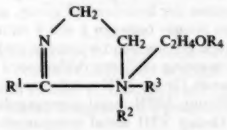
4,224,195

PROCESS FOR HANDWASHING SOCKS OR STOCKINGS

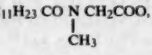
Yoshimi Kawasaki, Fujieda; Izumi Imaseki, Tokyo; Satoshi Hirano, Fujieda; Katsuhiko Amano, Fujieda, and Masatsune Shigematsu, Fujieda, all of Japan, assignors to Kabushiki Kaisha Tsumura Jutendo, Tokyo, Japan

Continuation of Ser. No. 756,954, Jan. 5, 1977, abandoned. This application Jul. 11, 1978, Ser. No. 923,946
Claims priority, application Japan, Apr. 28, 1976, 51-47838
Int. Cl.[2] C11D 1/38, 3/28
U.S. Cl. 252—546 7 Claims

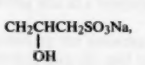
1. A process for washing socks or stockings which consists essentially of immersing socks or stockings in an aqueous solution of a detergent composition and washing same by hand, said detergent composition consisting essentially of, as effective components, an ethylene oxide adduct of one mole of a mixture of C_{11}–C_{15} secondary alcohols and 3, 5, 9 or 12 moles of ethylene oxide, or one mole of a mixture of C_{14}–C_{15} secondary alcohols and 3, 5 or 10 moles of ethylene oxide and mixtures thereof, and an ethoxy sulfate salt of an ethylene oxide adduct of a mixture of one mole of C_{11}–C_{15} or C_{14}–C_{15} secondary alcohols and 3 moles of ethylene oxide, and mixtures thereof, and an amphoteric surfactant selected from the group consisting of alkyldiaminoethylglycines wherein the alkyl group has from 8 to 18 carbon atoms, alkyldimethylbetaines wherein the alkyl group has from 12 to 18 carbon atoms and cyclic imidinium amphoteric surfactants of the formula:



wherein R^1 is an aliphatic hydrocarbon group of 7 to 17 carbon atoms, R^2 is a member selected from the group consisting of hydroxyl,



$C_{12}H_{25}OSO_3$, and $C_{13}H_{27}(OC_2H_4)_3OSO_3$, R^3 is a member selected from the group consisting of CH_2COOH, CH_2COONa, and



R^4 is a member selected from the group consisting of hydrogen, alkali metals, CH_2COOH, CH_2COONa and CH_2COOK; the weight ratio of the ethylene oxide adduct of a secondary alcohol to the surfuric ester salt of an ethylene oxide adduct of a secondary alcohol being in the range of from 95:5 to 30:70 and the weight ratio of the total of the ethylene oxide adduct of a secondary alcohol and the sulfuric ester salt of an ethylene oxide adduct of a secondary alcohol to the amphoteric surfactant being from 98:2 to 80:20.

4,224,196

FLEX RESISTANT SIDEWALL COMPOUNDS

Leonard Gursky, East Brunswick, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Dec. 7, 1978, Ser. No. 967,369
Int. Cl.[2] C08L 7/00, 15/02
U.S. Cl. 260—3.5 12 Claims

1. A pneumatic tire side wall composition comprising a blend of from 20 to 70 parts of halobutyl rubber, from 20 to 70 parts of a high unsaturation rubber, and from 10 to 60 parts of an oil extended terpolymer of ethylene, propylene and a diene, said oil extended terpolymer containing between about 25 and 150 phr, based on the weight of the terpolymer prior to oil extension, of an oil selected from the group consisting of naphthenic and paraffinic oils, wherein said terpolymer, prior to being oil extended, has a Mooney viscosity of greater than about 100 at 260° F.

4,224,197

RUBBER COMPOSITION FOR TIRE TREAD

Akio Ueda, and Shuichi Akita, both of Yokohama, Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Jul. 9, 1979, Ser. No. 55,520
Claims priority, application Japan, Jul. 11, 1978, 53-84373
Int. Cl.[2] C08L 7/00, 45/00
U.S. Cl. 260—5 3 Claims

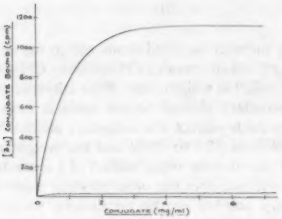
1. A rubber composition for the tread of tire having reduced rolling resistance and increased wet skid resistance with the mechanical properties unimpaired, said rubber composition comprising 20 to 80% by weight of (I) essentially amorphous polybutadiene having a 1,2-bond units content of at least 70% and a Mooney viscosity (ML_{1+4}, 100° C.) of 10 to 100; 10 to 75% by weight of (II) polybutadiene rubber having a 1,2-bond units content of 20% or less and a Mooney viscosity (ML_{1+4}, 100° C.) of 20 to 130; and 3 to 35% by weight of (III) at least one rubber selected from styrene/butadiene copolymer rubber having a bound styrene content of 15 to 25% by weight, natural rubber, and polyisoprene rubber having a cis-1,4-bond units content of at least 90%.

4,224,198

PROTEIN SPECIFIC POLYMERIC IMMUNOMICROSPHERES

Alan Rembaum; Shiao-Ping S. Yen, and William J. Dreyer, all of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 634,935, Nov. 24, 1975, Pat. No. 4,138,383.
This application May 26, 1978, Ser. No. 909,804
Int. Cl.[2] C08L *89/00*
U.S. Cl. 260—8 **18 Claims**



1. A method of forming a protein specific reagent comprising the step of covalently bonding a conjugate of the protein to polymeric beads having a diameter below 3500 Å and comprising

the copolymer of an addition polymerized, ethylenically unsaturated monomer mixture comprising in percent by weight:

25–50% by weight of a freely water-soluble monoethylenically unsaturated monomer substituted with a covalent bonding group selected from carboxyl, amino or hydroxyl;

5–20% by weight of a polyunsaturated cross-linking agent; and

40–70% by weight of at least one sparingly, water-soluble, ethylenically unsaturated, second monomer having hydrophobic characteristics.

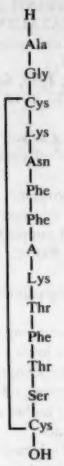
4,224,199

SOMATOSTATIN ANALOGS HAVING A SUBSTITUTED TRYPTOPHYL RESIDUE IN POSITION EIGHT

Chester A. Meyers, 120 Maple Cir., Slidel, La. 70458; David H. Coy, 4319 Perrier St., New Orleans, La. 70115, and Andrew V. Schally, 5025 Kawanee Ave., Metairie, La. 70002

Filed Apr. 9, 1979, Ser. No. 28,477
Claims priority, application Canada, May 19, 1978, 303800
Int. Cl.[2] C08L *37/00*; C07C *103/52*; A61K *37/00*
U.S. Cl. 260—8 **17 Claims**

1. A tetradecapeptide of the formula



in which A represents L, D or DL 5- or 6- fluoro-, bromo-, chloro- or iodo-tryptophyl, or a therapeutically acceptable acid addition salt thereof.

4,224,200

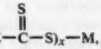
POLYMER CURING SYSTEM, AIR-CURABLE COMPOSITION AND METHOD OF PREPARING THE COMPOSITION

Charles M. Lamb, III, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 23, 1978, Ser. No. 954,037
Int. Cl.[2] C08L *91/00*
U.S. Cl. 260—18 R **21 Claims**

1. A composition comprising a type A compound and a type B compound,

wherein said type A compound is selected from the group consisting of substituted dithiocarbamates represented by the formula



wherein M is at least one metal selected from the group consisting of metals in groups IA, IB, IIA, IIB, IVA, VA, and VIA of the periodic table,

wherein Z is selected from the group consisting of

(1) an amino group having the formula H_2N—,

(2) a disubstituted amino group having the formula RR'N—,

(3) a monosubstituted amino group having the formula HRN—, and

(4) a heterocyclic amino group,

wherein R and R' are individually selected from the group consisting of hydrocarbyl groups having from 1 to about 18 carbon atoms per hydrocarbyl group, and

wherein x is an integer between 1 and 4 inclusive; and

wherein said type B compound is a compound selected from the group consisting of Group VIIB metal compounds of carboxylic acids, Group VIII metal compounds of carboxylic acids, Group VIIB metal compounds of beta diketones, and Group VIII metal compounds of beta diketones.

2. A composition according to claim **1** further comprising at least one base material selected from the group consisting of mercaptan-containing materials.

4,224,201

FOUNDRY BINDERS

David Dumolo, Dudley, England, assignor to Fordath Limited

Continuation-in-part of Ser. No. 836,924, Sep. 26, 1977. This application Dec. 19, 1978, Ser. No. 971,128

Claims priority, application United Kingdom, Jul. 21, 1977, 30608/77

Int. Cl.[2] B22C *1/22, 1/24;* C08L *91/00*

U.S. Cl. 260—18 TN 10 Claims

1. In a method of producing a foundry mould or core wherein there is mixed with a foundry aggregate a polyisocyanate and a polyhydroxy composition which reacts with the polyisocyanate to bind the aggregate, the improvement wherein, prior to mixing of the polyisocyanate with the aggregate, the polyisocyanate is modified by reaction with a drying oil.

4,224,202

ALKYD-MONOMER HIGH-SOLIDS COATING COMPOSITION

Philip Heiberger, Broomall, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 887,798, Mar. 17, 1978, abandoned. This application Jan. 18, 1979, Ser. No. 4,480

Int. Cl.[2] C09D *3/66*

U.S. Cl. 260—22 CB 21 Claims

1. A coating composition comprising
an unsaturated fatty acid alkyd resin,
an alkyd dimethacrylate or trimethacrylate monomer,
a cobalt salt effective as a catalyst for the oxidation cross-linking of the alkyd resin, and for initiating vinyl polymerization,
a complexing agent to block the cobalt catalyst, and
a polar solvent;
wherein the coating composition contains by weight, based on the alkyd resin plus the methacrylate monomer, at least about 50% of the alkyd resin, about from 10 to 40% by weight of the methacrylate monomer, and at least about 10% polar solvent.

4,224,203

VINYL CHLORIDE POLYMER STABILIZER COMPRISING A METAL ORGANOPHOSPHONATE

Motonobu Minagawa, Koshigaya; Tetsuo Sekiguchi, Hasuda; Naoyasu Kurita, Urawa, and Yuji Sugawara, Koshigaya, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Sep. 5, 1978, Ser. No. 939,324

Int. Cl.[2] C08K *5/09, 5/13, 5/53*

U.S. Cl. 260—23 XA 15 Claims

1. A stabilizer composition capable of enhancing the resistance to discoloration and loss of clarity of a vinyl chloride polymer when heated at 175° C., comprising (A) at least one metal salt of a monocarboxylic acid having 6 to 24 carbon atoms and free of sulfur and nitrogen, or a phenol having 6 to 30 carbon atoms and (B) at least one metal P-hydrocarbonphosphonate having linked directly to phosphorus one hydrocarbon group having 1 to 30 carbon atoms and three oxygen atoms of which at least one and not more than two are linked to metal.

13. A stabilized vinyl chloride polymer composition comprising a vinyl chloride polymer and a stabilizer composition according to claim 1.

4,224,204

USE OF HYDROCARBON POLYMERS TO IMPROVE OIL-CONTAINING WAXES

James W. Nichols; Rodney G. Lawrence, and Lyle D. McClure, all of Tulsa, Okla., assignors to Petrolite Corporation, St. Louis, Mo.

Filed Mar. 16, 1979, Ser. No. 21,290

Int. Cl.[2] C08L *91/00*

U.S. Cl. 260—23 H 11 Claims

1. An oil-containing wax characterized by the presence of sufficient hydrocarbon polymer to inhibit the exudation of the oil to the surface of the wax, said hydrocarbon polymer having congealing and melting points which are essentially no higher than those of its starting materials, said hydrocarbon polymer prepared by polymerizing a hydrocarbon starting material consisting primarily of alpha olefins and which is a solid at room temperature, in the presence of a source of free radicals under pressure of less than 500 psi but sufficient to keep the reactants from vaporizing and at a temperature of about 40° to 250° C.

6. An oil characterized by the presence of sufficient hydrocarbon polymer to thicken said oil, said hydrocarbon polymer having congealing and melting points which are essentially no higher than those of its starting materials, said hydrocarbon polymer prepared by polymerizing a hydrocarbon starting material consisting primarily of alpha olefins and which is a solid at room temperature, in the presence of a source of free radicals under pressure of less than 500 psi but sufficient to keep the reactants from vaporizing and at a temperature of about 40° to 250° C.

4,224,205

POLYVINYL ALCOHOL OPTICAL BRIGHTENING COMPOSITION

Yunosuke Nakagawa, Saitama, and Kozo Fujii, Funabashi, both of Japan, assignors to Kao Soap Company, Tokyo, Japan

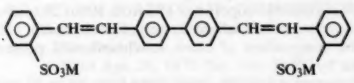
Filed Aug. 11, 1978, Ser. No. 933,028

Claims priority, application Japan, Aug. 15, 1977, 52-97660

Int. Cl.[3] C08L *29/04*

U.S. Cl. 260—29.6 B 9 Claims

1. A liquid composition consisting essentially of:
[I] 3 to 25 percent by weight of a mixture of,
(a) a nonionic surfactant of HLB 10 to 13 having one or more polyoxyethylene radicals in the molecule as a hydrophilic group,
(b) polyvinyl alcohol,
the weight ratio of said nonionic surfactant to said polyvinyl alcohol being 9/1 to 1/9,
[II] 0.3 to 5 percent by weight of a 4, 4'-bis(2-sulfostyryl)-biphenyl salt represented by the formula,



wherein M is sodium, potassium, monoethanol amine or diethanol amine, and
[III] the balance being water to make the total 100 percent by weight, said composition being uniformly transparent.

4,224,206

WATER SOLUBLE ESSENTIALLY LINEAR POLYMER HAVING A PLURALITY OF AMIDE, IMIDE AND ESTER GROUPS THEREIN, AND A METHOD OF MAKING THE SAME AND APPLYING THE SAME TO SUBSTRATES

George H. Sollner, Fort Wayne, Ind., assignor to Phelps Dodge Industries, Inc., New York, N.Y.

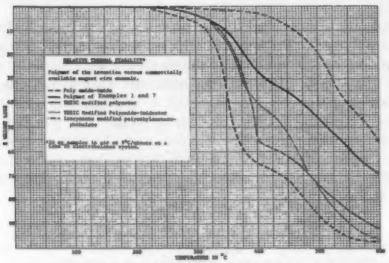
Filed Jul. 31, 1978, Ser. No. 929,102

Int. Cl.[3] C08G *73/16*

U.S. Cl. 260—29.2 N 20 Claims

1. An essentially linear and water soluble resin having a plurality of amide, imide and ester groups therein and the physical mechanical, chemical and electrical properties of a magnet wire insulation material comprising the condensation product having an acid number greater than about 10 of at least one polycarboxylic acid five member ring forming reactant, at least one ethylenicaly unsaturated polycarboxylic acid five or six member carboxy pyrrolidone ring forming reactant, at least one polyfunctional amino five or six member ring forming reactant, at least one glycol, at least one other polyfunctional

hydroxyl compound, at least one carboxylic acid ester reactant chosen from the group consisting of the acids, esters, alkyl esters, and anhydrides of terephthalic, isophthalic, phthalic and benzophenone dicarboxylic acids, and combinations thereof, the equivalent molar ratio of the functional hydroxyl groups of the glycols and hydroxyl compounds to the functional ester-forming carboxyl groups of said acid reactants being greater than about 1.0 to 1, the equivalent molar ratio of the functional



imide-forming groups of the acid reactants and said polyfunctional amino reactants to the functional carboxypyrrolidone-forming groups of the ethylenically unsaturated acids and polyfunctional amino reactants being greater than about 0.5 to 1 and less than about 3.0 to 1, the equivalent molar ratio of the functional imide-forming and carboxypyrrolidone-forming groups to the ester-forming groups being greater than about 0.2 to 1 and less than about 1.0 to 1.

4,224,207

HIGH IMPACT BLENDS OF SAN AND CROSS-LINKED POLYESTER ELASTOMERS

John C. Falk, Chicago, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Jun. 4, 1979, Ser. No. 45,570
Int. Cl.[3] C08L *3/24, 67/06*
U.S. Cl. 260—29.2 E **3 Claims**

1. A composition comprising from about 80 to about 60 wt% styrene-acrylonitrile copolymer and from about 20 to about 40 wt% of a cross-linked, aliphatic polyester elastomer.

3. The composition of claim **1**, wherein said polyester is prepared by

A. Preparing a solution comprising from 95 to 80 parts by weight of a water-immiscible organic solvent, from 5 to 20 parts by weight of an aliphatic polyester elastomer and from 0.5 to 5 wt%, based on polyester, of an organic peroxide;

B. Mixing said solution with an equal volume of water containing from 1 to 10 wt%, based on polyester, of a surfactant;

C. Passing said mixture through a homogenizer to form an emulsion;

D. Heating said emulsion to remove said solvent; and

E. Further heating said emulsion to cross-link said polyester.

4,224,208

TIRE PROTECTION COMPOSITION

Jerry B. Kent, Arlington, Tex., assignor to New World Products, Inc., Arlington, Tex.

Continuation-in-part of Ser. No. 768,024, Feb. 14, 1977, Pat. No. 4,137,206. This application Jan. 22, 1979, Ser. No. 5,011
Int. Cl.[2] C08L *29/04*
U.S. Cl. 260—29.6 B **12 Claims**

1. A method of imparting corrosion resistance to the metallic tire reinforcement elements within the elastomeric carcass of a tire which comprises introducing within said tire an aqueous tire sealing composition containing an organic volatile amine or amine salt capable of volatilizing within said tire, migrating to said elastomer, permeating said elastomer and reaching the metallic tire reinforcement elements; said sealing composition further containing a wheel corrosion inhibitor of a mixture of sodium nitrite and sodium tetraborate pentahydrate in ratios of weight of from 1:1 to 10:1.

4,224,209

POLYPHENYLENE ETHER RESIN COMPOSITIONS CONTAINING POLY(ALKYLENE OXIDES) AND PHOSPHATE PLASTICIZER

Glenn D. Cooper, and Arthur Katchman, both of Delmar, N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Sep. 5, 1978, Ser. No. 939,192
Int. Cl.[2] C08G *43/02*
U.S. Cl. 260—30.6 R **44 Claims**

1. A thermoplastic molding composition which, after molding, has a good impact strength, said composition comprising:

(a) a polyphenylene ether resin;

(b) a plasticizer; and

(c) a copolymer of alkylene oxide and alkyl glycidyl ether.

4,224,210

FIBER FROM ACRYLONITRILE COPOLYMERS HAVING REDUCED INFLAMMABILITY, COMPOSITIONS AND PROCESSES FOR MANUFACTURING THE SAME

Giorgio Cazzaro, Saronno; Giancarlo Matera, Monza; Domenico Malgeri, Magente, and Antonino Cavallaro, Milan, all of Italy, assignors to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A., Italy

Filed Oct. 19, 1978, Ser. No. 953,971
Claims priority, application Italy, Oct. 19, 1977, 28759 A/77
Int. Cl.[2] C08K *5/20;* **C08L** *33/20*
U.S. Cl. 260—32.6 N **9 Claims**

1. Process for the preparation of spinnable solutions of copolymers containing 50–85% by weight of acrylonitrile, 13.5–46.5% by weight of vinylidene chloride and 1.5–3.5% by weight of at least one significantly homopolymerizable comonomer which contains at least one sulphonic group, useful for the manufacture of modacrylic fibers having low inflammability and high luster, which process comprises the steps of copolymerizing, in a first copolymerization phase, acrylonitrile with said significantly homopolymerizable sulphonic comonomer, in an organic solvent miscible with water, in the presence of a catalyst, mixing the product derived from said first copolymerization phase with a solution of acrylonitrile and vinylidene chloride in the same solvent, and effecting a second copolymerization phase, the composition of the solutions being such that the final product has a water content below 4% by weight.

4,224,211

HEAT CURABLE COATING COMPOSITIONS COMPRISING PARTIALLY HYDROLYZED SILICON COMPOUNDS, ACRYLIC COPOLYMERS AND ETHERATED METHYLOLMELAMINE

Hiroyuki Kanazawa, and Mikio Futagami, both of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation of Ser. No. 734,877, Oct. 22, 1976, abandoned. This application Aug. 21, 1978, Ser. No. 935,381
Claims priority, application Japan, Oct. 24, 1975, 50-128582
Int. Cl.[2] C08K *5/01, 5/05, 5/06, 5/09*
U.S. Cl. 260—31.2 R **5 Claims**

1. A heat curable solution of a coating composition which provides a cured coating film having improved surface properties by calcining, comprising:

(A) solvent-soluble, partially hydrolyzed silicon compounds consisting essentially of co-partial hydrolyzates of an organic silicon compound of the formula:

$$R_nSi(OR')_{4-n}$$

wherein n is an integer of from 1 to 3, R is an alkyl group having from 1 to 6 carbon atoms or phenyl, and R′ is an alkyl having from 1 to 4 carbon atoms, and a tetraalkoxysilane wherein the alkoxy group is a member selected from the group consisting of methoxy, ethoxy, propoxy and butoxy, or a mixture of partial hydrolyzates of each organic silicon compound and tetraalkoxysilane, said partial hydrolyzate of tetraalkoxysilane being contained in an amount of from 5 to 99 parts by weight (calculated as SiO_2) per 100 parts by weight (calculated as $R_nSiO_{4-n/2}$) of the partial hydrolyzate of the organic silicon compound of the formula:

$$R_nSi(OR')_{4-n}$$

(B) five to 200 parts by weight of an acrylic copolymer which is a copolymer of an alkyl (meth)acrylate and a hydroxyalkyl (meth)acrylate, and 0 to 150 parts by weight of an etherated methylolmelamine per 100 parts by weight (calculated as $R_nSiO_{4-n/2}$) of the partial hydrolyzate of the organic silicon compound of the formula:

$$R_nSi(OR')_{4-n}$$

in (A),

(C) an additive selected from the group consisting of an acid, an organic amine, a metal carboxylate, a metal thiocyanate, a metal nitrite and an organic tin compound, and

(D) a solvent.

4,224,212

DISPERSING AGENTS, DISPERSIONS CONTAINING THESE AGENTS AND PAINTS AND INKS MADE FROM THE DISPERSIONS

Arthur Topham, Blackley, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jun. 28, 1978, Ser. No. 919,831

Claims priority, application United Kingdom, Jul. 15, 1977, 29803/77

Int. Cl.² B01F *17/52;* C08K *5/01, 5/02*

U.S. Cl. 260—33.6 R **16 Claims**

1. A dispersing agent comprising the reaction product of a poly(lower alkylene)imine with a polyester having a free carboxylic acid group, in which there are at least two polyester chains attached to each poly(lower alkylene)imine chain, the number average molecular weight of the polyester being in the range of 5600 to 560 and the molecular weight of the poly(-lower alkylene)imine being such that it has a viscosity measured at 25° C. as a 25% solution in water in the range of 9.3 to 2780 centipoises.

9. A dispersion of a finely divided solid in an organic liquid containing from 5 to 50% by weight of a dispersing agent according to claim 1.

4,224,213

SINGLE PACKAGE INORGANIC ZINC RICH PAINTS HAVING A SILICATE AND TITANATE ESTER COPOLYMER BINDER

Steven D. Johnson, Mission, Kans., assignor to Cook Paint and Varnish Company, Kansas City, Mo.

Filed Jun. 9, 1978, Ser. No. 914,295

Int. Cl.² C08B *83/02*

U.S. Cl. 260—37 SB **6 Claims**

1. A single package zinc-rich coating composition which has shelf life stability but which is self-curing on application to a metal substrate and exposure to atmospheric moisture to give a coating which is completely inorganic, said composition consisting essentially of a mixture of

(a) a non-catalyzed, essentially neutral or alkaline alkyl silicate of the formula $Si(OR)_4$ wherein R is alkyl selected from the group consisting of ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl and 2-ethyl hexyl;

(b) an alkyl titanate wherein the alkyl is selected from the group consisting of ethyl, n-propyl, isopropyl, n-butyl, isobutyl, sec-butyl and 2-ethyl hexyl; and

(c) zinc powder, components (a) and (b) functioning as the sole binder for said zinc powder, the composition being free from any added film-forming organic polymer and the powder being present in an amount sufficient to function as an anode to cathodically protect a ferrous substrate coated with said composition, the alkyl titanate being present in an amount of about 10–60% titanate as TiO_2 based on the total weight of the titanate and silicate as TiO_2 and SiO_2, respectively.

4,224,214

INJECTION MOLDING OF AMIC ACID AND AMIDE-IMIDE POLYMERS AND MOLDING COMPOSITIONS

Yu-Tsai Chen, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 850,397, Nov. 10, 1977, abandoned. This application Jul. 25, 1978, Ser. No. 927,771

Int. Cl.² C08K *7/02*

U.S. Cl. 260—37 N **17 Claims**

1. A process for injection molding a polymer prepared by polymerizing components consisting essentially of at least one aromatic tricarboxylic acid derivative, said acid having two carboxyl groups ortho to one another, and at least one aromatic diprimary diamine having 6 to 10 carbon atoms or composed of two aromatic moieties of 6 to 10 carbon atoms each, each of said moieties containing one primary amino group and being linked to the other moiety directly or through —O—, —S—, —SO_2—, —CO—, or —CH_2—, the molecular weight of said polymer being controlled such that the spiral flow rate thereof is at least about 4 inches at 600° F. and 20,950 psi., said injection molding comprising plasticating and compacting said polymer between the flights of a high-compression ratio screw under reciprocating screw injection molding conditions.

4,224,215

FILLED POLYCARBONATE COMPOSITIONS

Gerald F. Macke, Mt. Vernon, Ind., assignor to General Electric Company, Pittsfield, Mass.

Filed Apr. 20, 1979, Ser. No. 31,993

Int. Cl.² C08L *7/14, 69/00, 83/10*

U.S. Cl. 260—37 PC **13 Claims**

1. A filled polycarbonate composition having improved impact properties, said polycarbonate composition comprising an admixture of a high molecular weight aromatic polycarbonate; a filler in an amount of about 5–40% by weight of said polycarbonate; and, an organopolysiloxane-polycarbonate block copolymer additive in an amount of about 0.5–5.0% by weight of said polycarbonate.

4,224,216

POLYPROPYLENE/GLASS FIBER/IMIDE/THERMOPLASTIC ELASTOMER BASED COMPOSITIONS

Jean-Louis Locatelli, Vienne, and Louis Macabrey, Mitry-le Neuf, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Nov. 17, 1978, Ser. No. 961,770

Claims priority, application France, Nov. 18, 1977, 77 34686

Int. Cl.² C08K *7/14*

U.S. Cl. 260—42.18 **18 Claims**

1. A composition of matter, comprising (A) polypropylene, (B) an unsaturated dicarboxylic acid imide, (C) glass fibers, and (D) a thermoplastic ethylene elastomer.

4,224,217
COMBUSTION RESISTANT AROMATIC POLYMERS CONTAINING CHAR-FORMING BENZYL AND/OR ALLYL MOIETIES

Kent S. Dennis, Midland, Mich., and Joseph W. Raksis, Columbia, Md., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 5, 1978, Ser. No. 866,971
Int. Cl.³ C08L *69/00, 55/02, 25/08*
U.S. Cl. 260—45.7 R **21 Claims**

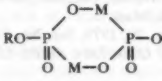
1. A char-forming aromatic polymer composition comprising (1) a normally solid aromatic polymer containing polymerized bromostyrene in an amount to reduce the flame propagation characteristics of the aromatic polymer and dispersed in said composition (2) a char-forming amount in the range from about 0.1 to about 1.5 milliequivalents of a plurality of active benzyl and/or active allyl moieties per gram of the composition and (3) an inorganic compound in an amount effective to enhance char formation of the composition.

4,224,218
STABILIZED VINYL CHLORIDE POLYMER COMPRISING A METAL MONO-ORGANIC PHOSPHITE

Motonobu Minagawa, Koshigaya; Tetsuo Sekiguchi, Hasuda; Naoyasu Kurita, Urawa, and Yuji Sugawara, Koshigaya, all of Japan, assignors to Argus Chemical Corporation, Brooklyn, N.Y.

Filed Sep. 25, 1978, Ser. No. 945,307
Claims priority, application Japan, Sep. 25, 1977, 52-114772
Int. Cl.² C08K *5/52*
U.S. Cl. 260—45.7 PH **11 Claims**

1. A stabilizer composition capable of enhancing the resistance to deterioration in color, clarity, and compatibility of a vinyl chloride polymer composition when heated at 175° C. comprising (A) at least one metal salt of a monohydric phenol having 6 to 30 carbon atoms or of a nitrogen and sulfur free monocarboxylic acid having 6 to 24 carbon atoms of magnesium, calcium, zinc, strontium, barium, cadmium, stannous tin, lead, or dialkyltin, and (B) per part of salt (A) from 0.1 to 10 parts of at least one phosphorous acid monoester metal salt in which the molar ratio of phosphrous acid monoester to metal is 1:1, the phosphorous acid monoester metal salt being represented by the formula



in which M represents a magnesium, calcium, zinc, strontium, barium, cadmium, stannous tin, or lead atom or a dialkyltin group, and each of R and R′ independently is an alkyl group having 1 to 20 carbon atoms, an aralkyl group having 7 to 20 carbon atoms, a cycloalkyl group having 5 to 20 carbons, an aryl or alkaryl group having 6 to 24 carbon atoms and not more than one ortho-substituent, or an ether-alcohol group having 3 to 40 carbon atoms and 1 to 12 ether groups.

4,224,219
METHOD FOR PRODUCING WATER SOLUBLE CORN PROTEIN DERIVATIVES BY REACTING WITH ALKYLENE OXIDE

M. Van Blanton, Fenton, and Barrett L. Scallet, Clayton, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Nov. 15, 1978, Ser. No. 960,843
Int. Cl.² A23J *0/00*
U.S. Cl. 260—112 G **9 Claims**

1. A process for producing a corn protein derivative that is soluble in an aqueous medium having a pH of about 9 to about 9.5 comprising the steps of:

A. dissolving a corn protein fraction selected from the group consisting of commercial corn gluten, purified corn gluten, commercial zein, and purified zein in water containing an alcohol or either an organic or inorganic base,

B. reacting the dissolved corn protein fraction with an alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and mixtures of ethylene oxide and propylene oxide, and

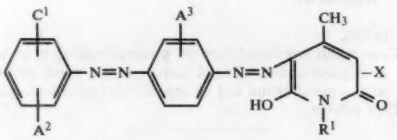
C. recovering the resulting corn protein derivative.

4,224,220
AZO DYES

Gunther Lamm, Hassloch, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jan. 8, 1979, Ser. No. 1,846
Claims priority, application Fed. Rep. of Germany, Jan. 18, 1978, 2801951
Int. Cl.² C09B *31/14*
U.S. Cl. 260—156 **9 Claims**

1. A dye of the formula



A^2 is hydrogen or methyl,
A^3 is hydrogen, methyl or ethyl,
X is hydrogen, cyano or carbamoyl and
R^1 is hyrogen or C_1- to C_8-alkyl.

4,224,221
MODIFIER COMPOSITION FOR AZO PIGMENTS BASED ON 2-HYDROXY-3-NAPHTHOIC ACID

David R. Burley, Cranbury, and Christopher J. Brookes, Somerville, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 5, 1979, Ser. No. 1,566
Int. Cl.² C09B *29/10*
U.S. Cl. 260—202 **10 Claims**

1. In a process for the preparation of an azo pigment whereby the diazo of an aromatic aminosulfonic acid is coupled into 2-hydroxy-3-naphthoic acid, and whereby said pigment is optionally converted into the alkali metal, alkaline earth metal, or manganese salt thereof, the improvement which comprises: using as the coupling component a composition comprising from about 90 to 99 percent by weight of 2-hydroxy-3-naphthoic acid and from about 1 to 10 percent by weight of an alpha substituted-2-hydroxy-3-naphthoic acid.

4,224,222
PROCESS FOR PREPARING COPPER PHTHALOCYANINE PIGMENTS OF THE α-MODIFICATION

Ernst Spietschka, Oberauroff; Siegfried Schiessler, and Wolfgang Tronich, both of Frankfurt am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 529,521, Dec. 4, 1974, abandoned. This application Oct. 20, 1978, Ser. No. 953,185
Claims priority, application Fed. Rep. of Germany, Dec. 6, 1973, 2360793
Int. Cl.² C09B *47/04*
U.S. Cl. 260—314.5 **4 Claims**

1. In a process for the preparation of a very pure halogenated copper phthalocyanine pigment of the α-modification wherein halogenated copper phthalocyanine is converted into its sulfate and said sulfate is isolated and then hydrolyzed, the

improvement comprising the step of grinding the so-obtained halogenated copper phthalocyanine of the α-modification, without intermediate drying, in an aqueous solution of 2 to 10% by weight of an aliphatic or cycloaliphatic alcohol having 3 to 6 carbon atoms.

4,224,223

PREPARATION OF ALKYLENE CARBONATES FROM OLEFINS

Gregory A. Wheaton, Swedesboro; Jar-lin Kao, and Ming N. Sheng, both of Cherry Hill, all of N.J., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 23, 1979, Ser. No. 68,997

Int. Cl.[2] C07D *317/36, 317/38*

U.S. Cl. 260—340.2 **7 Claims**

1. A process for the preparation of a cyclic alkylene carbonate ester which comprises reacting in a liquid phase a cyclic or linear olefin having from 2 to 15 carbon atoms with carbon dioxide at a temperature of from 50° to 160° C., at a total pressure of from 200 to about 2,000 psig and a pH value of between about 4 and 8, in the presence of oxygen or an oxygen-containing gas and a catalytic amount of a mixture of

(a) iodine or an iodide of a metal selected from Groups IA, IB, IIA, IIB, VB, VIIB, and VIII of the Periodic Table of Elements and

(b) A catalytic iron compound, copper compound or mixture thereof deposited on an inert supporting material, and recovering the desired cyclic alkylene carbonate ester.

4,224,224

CERTAIN 1-(CARBOCYCLIC ARYL)-1-HALO(OR MESYLOXY OR TOSYLOXY)-2-(3'-ALKOXYCARBONYLGUANIDINO) ETHANES

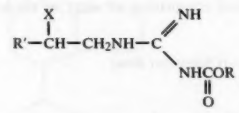
Charles A. Dvorak, and Colin C. Beard, both of Palo Alto, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 840,336, Oct. 7, 1977, Pat. No. 4,172,204. This application Jun. 21, 1979, Ser. No. 50,836

Int. Cl.[2] C07D *317/54;* C07C *129/12*

U.S. Cl. 260—340.5 R **13 Claims**

1. A compound of the formula



wherein

R is C_1 to C_6 linear or branched alkyl,

R' is phenyl, optionally substituted with the radical methylenedioxy or with at least one hydroxy, trifluoromethyl, halo, C_1 to C_6 linear or branched alkoxy or C_1 to C_6 linear or branched alkyl, or 1-naphthyl or 2-naphthyl and

X is the radical selected from the group halo, mesyloxy, and tosyloxy and pharmaceutically acceptable salts thereof.

4,224,225

2-ARYLNAPHTHO[1,8-bc]FURAN-5-ONES

Yasuhiro Noguchi; Syunichi Kondo; Akihiro Matsufuji; Hisatake Ono, all of Asaka, and Toshio Uchida, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

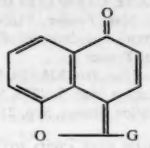
Filed Oct. 20, 1978, Ser. No. 953,318

Claims priority, application Japan, Oct. 20, 1977, 52-126270

Int. Cl.[2] C07D *307/92*

U.S. Cl. 260—346.71 **4 Claims**

1. A 2-arylnaphtho[1,8-bc]furan-5-one represented by the general formula (I):



(I)

wherein G represents a substituted phenyl group, an unsubstituted or substituted 1-naphthyl group and an unsubstituted or substituted 2-naphthyl group, with the substituents being selected from the group consisting of a straight chain or branched chain alkyl group having 1 to 5 carbon atoms, a straight chain or branched chain alkoxy group having 1 to 3 carbon atoms and a chlorine atom.

4,224,226

PROCESS FOR THE PRODUCTION OF N-SUBSTITUTED α-KETOCARBOXYLIC ACID AMIDES

Axel Kleemann; Herbert Klenk; Heribert Offermanns, all of Hanau; Paul Scherberich, Dietzenbach, and Werner Schwarze, Frankfurt, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Fed. Rep. of Germany

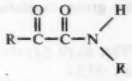
Filed Jul. 20, 1978, Ser. No. 926,322

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733181

Int. Cl.[3] C07C *102/08;* C07D *307/54*

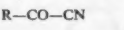
U.S. Cl. 260—347.3 **16 Claims**

1. A process for the preparation of a compound having the formula



(I)

where R' is a t-alkyl group having 4 to 18 carbon atoms and R is an alkyl group having 1 to 18 carbon atoms, a substituted alkyl group having 1 to 18 carbon atoms wherein the substituents are phenyl or halogen, a cycloalkyl group having 3 to 8 carbon atoms, a substituted cycloalkyl group wherein the substituents are 1 to 3 carbon atom alkyl or halogen, a five membered heterocyclic group, phenyl or naphthyl or substituted phenyl, naphthyl or five membered heterocyclic group wherein the substituents are halogen, nitro, 1 to 5 carbon atom alkyl or 1 to 5 carbon atom alkoxy comprising condensing in acid medium an acyl cyanide of the formula



(II)

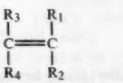
with either

(a) a tertiary alcohol of the formula

(III)

or

(b) an alkene of the formula



(IV)

where R_1 and R_2 are hydrogen or alkyl and R_3 and R_4 are alkyl, the alkyl groups in (IV) containing 1 to 15 carbon atoms.

4,224,227

NOVEL CYCLOPROPANE CARBOXYLIC ACID ESTERS

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

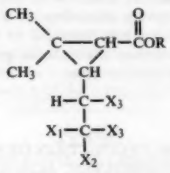
Continuation-in-part of Ser. No. 834,659, Sep. 19, 1977, abandoned. This application Mar. 7, 1979, Ser. No. 18,166

Claims priority, application France, Sep. 21, 1976, 76 28279; Jul. 19, 1977, 77 22078

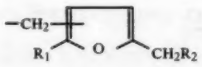
Int. Cl.[3] **A01N** *9/28;* **C07D** *307/54*

U.S. Cl. 260—347.4 **11 Claims**

1. A compound of the formula



wherein X_1 is selected from the group consisting of hydrogen, fluorine, chlorine and bromine, X_2 is selected from the group consisting of fluorine, chlorine and bromine, X_3 is selected from the group consisting of chlorine, bromine and iodine and R has the formula



wherein R_1 is selected from the group consisting of hydrogen and methyl and R_2 is selected from the group consisting of monocyclic aryl and $—CH_2—CN$.

4,224,228

WATER-SOLUBLE ANTHRAQUINONE DYES

Jean-Marie Adam, Saint-Louis, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

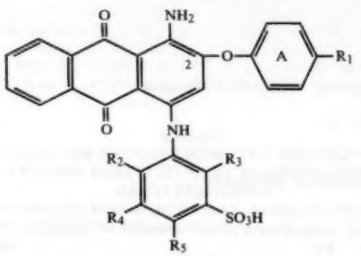
Continuation of Ser. No. 908,477, May 22, 1978, abandoned. This application Dec. 19, 1978, Ser. No. 971,134

Claims priority, application Luxembourg, May 26, 1977, 77418; Nov. 3, 1977, 78437

Int. Cl.[2] **C07C** *143/665*

U.S. Cl. 260—372 **21 Claims**

1. A new water-soluble anthraquinone dye which, in the form of the free acid, corresponds to the formula [I]



(I)

wherein

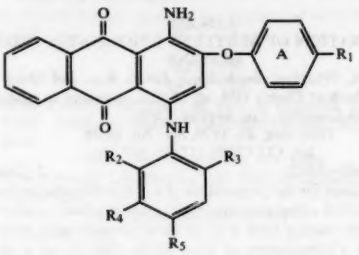
R_1 represents a straight or branched alkyl group having 4 to 8 carbon atoms,

R_2 and R_3 independently of one another represent a straight or branched alkyl group having 1 to 4 carbon atoms,

R_4 represents hydrogen, an optionally acylated amino group, or a fibre-reactive radical bonded by way of an amino group,

R_5 represents hydrogen, or a straight or branched alkyl group having 1 to 4 carbon atoms.

19. An intermediate product of the formula [IV]



(IV)

wherein

R_1 represents a straight or branched alkyl group having 4 to 8 carbon atoms,

R_2 and R_3 independently of one another represents a straight or branched alkyl group having 1 to 4 carbon atoms,

R_4 represents an optionally acylated amino group, or a fibre-reactive radical bonded by way of an amino group,

R_5 represents hydrogen, or a straight or branched alkyl group having 1 to 4 carbon atoms.

4,224,229

COMPOUND USEFUL IN CHOLESTEROL ASSAY PROCEDURES

Gary J. Proksch, 1045 W. 77 S. Dr., and Dean P. Bonderman, 586 W. 77th N. Dr., both of Indianapolis, Ind. 46260

Division of Ser. No. 825,202, Aug. 17, 1977. This application Oct. 23, 1978, Ser. No. 953,449

Int. Cl.[2] **C07J** *9/00*

U.S. Cl. 260—397.2 **11 Claims**

10. A compound useful in assay procedures for measuring serum cholesterol comprising an ester of cholesterol having the formula:

$$R—_7—R_8—[\text{Cholesterol Base}]$$

in which:

R_7 is serum albumin; and

R_8 is a dicarboxyl group having between about 3 and about 20 carbon atoms, the dicarboxyl group having a first carboxyl group attached by an ester linkage to the 3 beta position of the Cholesterol Base and further having a second carboxyl group attached to the serum albumin by an amide bond with one of the lysine residues of the serum albumin.

4,224,230

FLUOROVITAMIN D COMPOUNDS AND PROCESSES FOR THEIR PREPARATION

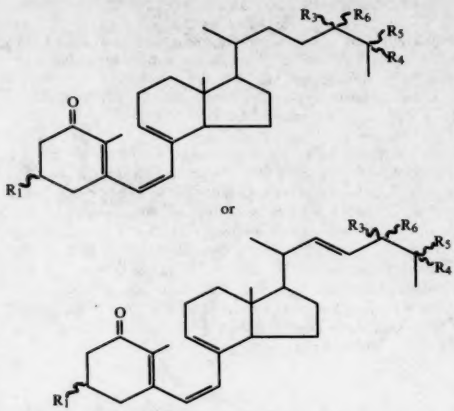
Hector F. DeLuca; Heinrich K. Schnoes; Joseph L. Napoli, Jr., and Bruce L. Onisko, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Division of Ser. No. 928,279, Jul. 26, 1978, abandoned. This application Aug. 6, 1979, Ser. No. 64,208

Int. Cl.[2] **C07J** *9/00*

U.S. Cl. 260—397.2 **2 Claims**

1. Compounds having the formula



where R_1 is selected from hydrogen or O-acyl,
R_3, R_4, and R_5 are each selected from the group consisting of hydrogen, lower-alkyl, O-lower-alkyl, O-lower acyl and fluoro, except that at least one of R_3, R_4 and R_5 must be fluoro, and
R_6 is hydrogen or lower alkyl.

4,224,231

DERIVATIVES OF 25-HYDROXYCHOLECALCIFEROL

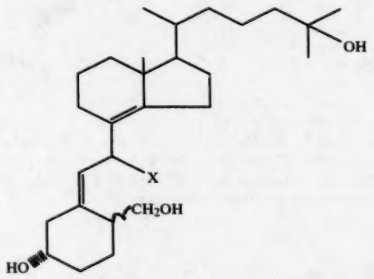
Hector F. DeLuca; Heinrich K. Schnoes; Yoko Tanaka, all of Madison, and Joseph B. Alper, Waunakee, all of Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Sep. 4, 1979, Ser. No. 71,972

Int. Cl.[2] **C07J** *9/00*

U.S. Cl. 260—397.2 **2 Claims**

1. Compounds having the formula



where X is selected from keto or hydroxy.

4,224,232

PRODUCTION OF CARBOXYLIC ACIDS FROM OLEFINS AND MIXTURES OF OLEFINS

Anatoli Onopchenko, Monroeville, and Johann G. D. Schulz, Pittsburgh, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 780,929, Mar. 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 367,176, Jun. 5, 1973, abandoned. This application Dec. 21, 1978, Ser. No. 971,707

Int. Cl.[2] **C11C** *1/00*

U.S. Cl. 260—413 **8 Claims**

1. A process for the production of carboxylic acids from a straight chain, unbranched normal alpha olefin having from 20 to 24 carbon atoms or mixtures of straight chain, unbranched normal alpha olefins having from 20 to 24 carbon atoms, said olefins being solids at ambient conditions of temperature and pressure, aqueous sulfuric acid of at least 90 percent strength, carbon monoxide and water which comprises heating said olefins to a temperature above the melting point of said olefins and then adding said olefins incrementally in a fine particulate form to a reaction zone wherein the temperature is in the range of about 0° to about 50° C. and the pressure about 100 to 5000 pounds per square inch gauge, containing carbon monoxide and sulfuric acid of at least 90 percent strength, adding water to the reaction product to produce carboxylic acids and thereafter recovering the desired carboxylic acid product.

4,224,233

PROCESS FOR THE PRODUCTION OF ALKYLSILANES

Claus-Dietrich Seiler, Rheinfelden, and Hans-Joachim Vahlensieck, Wehr, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 3, 1979, Ser. No. 26,633

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1978, 2815316

Int. Cl.[2] **C07F** *7/08*

U.S. Cl. 556—478 **13 Claims**

1. In a process for the preparation of an alkylsilane or substituted alkylsilane substituted in the alkyl group by an addition reaction in the presence of a platinum or palladium catalyst, deposited on a carrier wherein the catalyst is disposed above the reaction mixture and below a cooling system from which condensate from the cooling system drops onto said catalyst, and reaction component is vaporized, rises to said cooling means and is condensed therein, the improvement which comprises maintaining the rising vapors of said reaction component in out of contact relationship with respect to said catalyst.

4,224,234

METHOD FOR PREPARATION OF ORTHOSILICIC ACID TETRAALKYL ESTERS

Wilhelm Flick, Cologne; Hermann Richtzenhain, Much-Schwellenbach; Volker Hunger, and Wilhelm Joch, both of Niederkassel, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Apr. 16, 1979, Ser. No. 30,499

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1978, 2816386

Int. Cl.[2] **C07F** *7/04*

U.S. Cl. 556/472 **6 Claims**

1. In a method for the preparation of an orthosilicic acid tetraalkyl ester whose ester component contains 2 to 6 carbon atoms by contacting metallic silicon with alcohol in the presence of at least 70 percent of the desired orthosilicic acid tetraalkyl ester and in the presence of an alkali alcoholate corresponding to the alcohol employed, the improvement which comprises carrying out the reaction in the co-presence of an ether alcohol or an alkanolamine.

4,224,235

RHODIUM CATALYST REGENERATION BY THERMAL TREATMENT

Robert W. Beisner, Charleston, and Stephen C. Winans, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

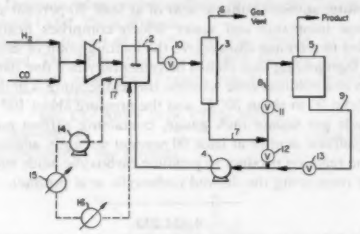
Filed Dec. 11, 1978, Ser. No. 968,371

Int. Cl.[2] **C07C** *27/06;* **B01J** *31/40, 23/96*

U.S. Cl. 260—449 L **8 Claims**

1. In a process for producing alkane polyols in a reaction zone by the continuous reaction of hydrogen and oxides of carbon in a homogeneous liquid phase mixture containing a rhodium carbonyl complex catalyst at a temperature of from about 100° C. to about 375° C. and a pressure of from about 500 psia to about 50,000 psia, the improvement which comprises

periodically lowering the temperature of said liquid phase mixture and thereafter raising it to about its former value.



4. The process of claim 1 wherein in said improvement a portion of said liquid phase mixture has its temperature periodically lowered outside the reaction zone and is then returned to said reaction zone.

4,224,236

PROCESS FOR THE MANUFACTURE OF OXYGEN-CONTAINING CARBON COMPOUNDS FROM SYNTHESIS GAS

Friedrich Wunder, Flörsheim am Main; Hans-Jürgen Arpe, Kelkheim; Ernst I. Leupold, Neu-Anspach, and Hans-Joachim Schmidt, Königstein, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 29, 1979, Ser. No. 25,032

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814427; Jun. 10, 1978, 2825598; Nov. 18, 1978, 2850201

Int. Cl.[2] C07C *27/06*

U.S. Cl. 260—449 R **11 Claims**

1. A process for the manufacture of acetic acid, ethanol, acetaldehyde and any secondary products thereof which comprises catalytically reacting carbon monoxide and hydrogen using a catalyst, applied onto a carrier, containing metallic rhodium and halide ions in admixture with a co-catalyst of magnesium salts and/or magnesium complex compounds and/or compounds of magnesium with oxides of elements selected from groups III to VI of the Periodic Table and reducing the catalyst at a temperature in the range of 350° C. to 550° C.

4,224,237

CATALYTIC PROCESS FOR POLYHYDRIC ALCOHOLS AND DERIVATIVES

Leonard Kaplan, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation of Ser. No. 615,093, Sep. 19, 1975, abandoned, which is a continuation-in-part of Ser. No. 537,885, Jan. 2, 1975, abandoned. This application Jul. 27, 1979, Ser. No. 61,456

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.[2] C07C *27/06, 29/16*

U.S. Cl. 260—449 L **54 Claims**

1. The process of making alkane diols and triols having from 2 to 3 carbon atoms in the molecule which comprises reacting a mixture consisting essentially of oxides of carbon and hydrogen in the presence of a rhodium carbonyl complex and dimethylsulfone or a tetramethylene sulfone solvent at a pressure of from about 1000 psia. to about 50,000 psia. correlated with a temperature of about 100° C. to about 375° C. sufficient to produce said diols and triols.

4,224,238

PROCESS FOR PREPARING TERTIARY ALKYL ISOCYANATES

Nobuyuki Nagato, Wako, and Taketoshi Naito, Yokohama, both of Japan, assignors to Showa Denko K.K., Tokyo, Japan

Filed Apr. 16, 1979, Ser. No. 30,649

Claims priority, application Japan, Apr. 18, 1978, 53/44833

Int. Cl.[2] C07C *118/00*

U.S. Cl. 260—453 P **10 Claims**

1. A process for preparing an alkyl isocyanate having the isocyanato group bonded to a tertiary carbon atom of the alkyl group, which comprises reacting the corresponding alkyl halide having the halogen atom bonded to the tertiary carbon atom of the alkyl group, with an alkyl metal cyanate in an organic solvent in a substantially anhydrous condition at a temperature between 0° C. and 200° C. in the presence of, as a catalyst, at least one salt selected from the group consisting of mineral acid salts or carboxylic acid salts of Zn, Fe, Sb, Sn and Co, said organic solvent being an aprotic solvent which forms no salt or adduct with a hydrogen halide.

4,224,239

PROCESS FOR PREPARING OPTICALLY ACTIVE AMINO ACID OR MANDELIC ACID

Yasuhisa Tashiro, Yokohama; Takashi Nagashima, Saitama; Shigeru Aoki, and Rinzo Nishizawa, both of Tokyo, all of Japan, assignors to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 886,745, Mar. 15, 1978. This application Apr. 24, 1979, Ser. No. 33,021

Claims priority, application Japan, Mar. 24, 1977, 52/31555

Int. Cl.[2] C07C *101/04, 101/08;* C07B *19/00*

U.S. Cl. 260—501.11 **9 Claims**

1. A process for preparing an optically active amino acid-mandelic acid complex characterized by reacting in a solvent, at a pH of 1.0 to 4.0 and at a temperature of room 50° C. to the boiling point of the solvent, an optically active isomer of an amino acid of the formula:

wherein R is a methyl, ethyl or methylthioethyl group, with racemic mandelic acid in an amount of 0.3 to 6.0 equivalents per unit equivalent to said amino acid, or a raceme of said amino acid with an optically active isomer of mandelic acid in an amount of 0.3 to 6.0 equivalents per unit equivalent to said amino acid, and crystallizing and separating the thus resulting complexes by selective crystallization of the less soluble isomer complex at a temperature of from 0° to 50° C.

4,224,240

PREPARATION OF PARA-MENTH-1-ENE-7-SULFONATE SALTS AND CORRESPONDING ACIDS

Bernard J. Kane, Atlantic Beach, and Sean G. Traynor, Jacksonville, both of Fla., assignors to SCM Corporation, Cleveland, Ohio

Continuation of Ser. No. 879,127, Feb. 21, 1978, abandoned. This application Apr. 13, 1979, Ser. No. 29,858

Int. Cl.[3] C07C *143/22*

U.S. Cl. 260—503 **18 Claims**

1. A process for making a para-menth-1-ene-7-sulfonate salt which comprises:

maintaining an aqueous reaction mixture of β-pinene and a bisulfite salt under free radical conditions at a temperature of at least about 50° C. until said para-menth-1-ene-7-sulfonate salt is formed,

and recovering said para-menth-1-ene-7-sulfonate salt from said reaction mixture,

said para-menth-1-ene-7-sulfonate salt having substantially the same optical purity as the starting β-pinene.

4,224,241
PRODUCTION OF HALOGENOMETHYLPHOSPHINIC ACID HALIDES

Hubert Neumaier, Hürth, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed May 21, 1979, Ser. No. 40,677

Claims priority, application Fed. Rep. of Germany, May 24, 1978, 2822655

Int. Cl.[2] C07F *9/34*

U.S. Cl. 260—543 P **3 Claims**

1. A process for making halogenomethylphosphinic acid halides of the general formula:

$$XCH_2(R)P(O)X$$

in which R stands for a methyl, ethyl, phenyl, halogenomethyl, halogenoethyl or halogenophenyl group and X stands for a halogen atom, which comprises: reacting an organyldihalogenophosphane of the general formula:

in which R and X have the meanings given above, with trioxane in the presence of aluminum-III-chloride, tin-IV-chloride, borofluoride etherate, phosphoric acid, sulfuric acid, hydrogen bromide or hydrogen chloride as a catalyst, the reaction being effected at temperatures of 80° to 250° C.

4,224,242
N-[3-(LOWER)ALKYLAMINOPROPYL]-N'-(DISUBSTITUTED)PHENYLUREAS

Theodore S. Sulkowski, Wayne; James L. Bergey, Lansdale, and Albert A. Mascitti, Norristown, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Jul. 3, 1978, Ser. No. 921,295

Int. Cl.[2] C07C *127/19*; A61K *31/17*

U.S. Cl. 260—553 A **10 Claims**

1. A compound of the formula:

wherein:

Y is 2,6-dimethylphenyl, 2,5-dimethylphenyl, 3,5-dimethylphenyl, or 5-chloro-2-methylphenyl; and

X is ethyl, propyl, isopropyl, n-butyl, or isobutyl; or a nontoxic, pharmaceutically acceptable acid addition salt thereof.

4,224,243
PROCESS FOR PRODUCING DIMETHYL FORMAMIDE

Tetsuo Aoyama; Shigeru Horie; Kozo Sano; Hidetaka Kiga; Kinichi Mizuno, and Takeo Ikarashi, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Jun. 18, 1979, Ser. No. 49,604

Claims priority, application Japan, Jun. 23, 1978, 53/76113

Int. Cl.[3] C07C *102/00, 103/36*

U.S. Cl. 260—561 R **15 Claims**

1. A process for producing dimethyl formamide by reaction of a mixture selected from the group consisting of the mixtures of: (a) monomethyl amine and trimethyl amine, (b) monomethyl amine, monomethyl formamide and trimethyl amine, (c) monomethyl formamide and trimethyl amine, (d) monomethyl amine, trimethyl amine and dimethyl amine, (e) monomethyl amine, monomethyl formamide, trimethyl amine and dimethyl amine and (f) monomethyl formamide, trimethyl amine and dimethyl amine; with carbon monoxide, said process carried out in the presence of a compound selected from the group consisting of metallic iron and an iron compound as a catalyst, wherein said process comprises conducting the reaction in the presence of hydrogen gas.

4,224,244
9-PHENYL 5,6-DIMETHYL-NONA-2,4,6,8 TETRAENAL OR TETRAENOL DERIVATIVES

Werner Bollag, Basel; Rudolf Ruegg, Bottmingen, and Gottlieb Ryser, Basel, all of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

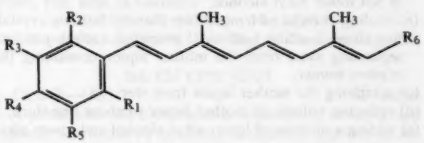
Division of Ser. No. 903,438, May 8, 1978, abandoned, which is a division of Ser. No. 714,170, Aug. 13, 1976, Pat. No. 4,105,681, which is a continuation-in-part of Ser. No. 601,148, Aug. 1, 1975, abandoned, which is a continuation-in-part of Ser. No. 454,007, Mar. 22, 1974, abandoned. This application May 9, 1979, Ser. No. 37,270

Claims priority, application Switzerland, Mar. 30, 1973, 4603/73; Feb. 7, 1975, 1547/75

Int. Cl.[3] C07C *97/16, 103/10, 47/56, 5/09, 7/00, 7/14*

U.S. Cl. 260—562 R **1 Claim**

1. A compound of the formula:



wherein R_1 and R_2 are lower alkyl; R_3 is hydrogen, lower alkyl, lower alkoxy, lower alkenyloxy, nitro, amino, lower alkylamino or alkanoylamino; R_4 is lower alkoxy; R_5 is hydrogen, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, amino, lower alkanoylamino or lower alkylamino; and R_6 is formyl, hydroxymethylene or alkoxymethylene; or pharmaceutically acceptable salts thereof.

4,224,245
METHOD OF MAKING 1-(ALKOXYPHENYL)-5-(PHENYL)BIGUANIDE COMPOUNDS WHICH ARE USEFUL AS AGRICULTURAL FUNGICIDES

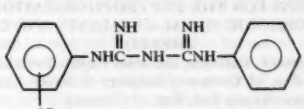
Louis Schneider, Elizabeth, and Bruce M. Resnick, West Paterson, both of N.J., assignors to GAF Corporation, New York, N.Y.

Filed Apr. 25, 1979, Ser. No. 33,244

Int. Cl.[3] C07C *129/16*

U.S. Cl. 260—565 **14 Claims**

1. In a method for making 1-(alkoxyphenyl)-5-(phenyl)-biguanide compounds having the formula:



where R is alkyl, linear or branched, having from 1–14 carbon atoms, as the acid addition salts thereof, which comprises the steps of:

(a) alkylating a nitrophenol with RX, where R is as defined above, and X is a halide, in a reaction solvent in the pressure of an acid acceptor, to form an alkoxynitrobenzene intermediate,

(b) reducing said intermediate by catalytic hydrogenation to form the corresponding alkoxyaniline, and,

(c) condensing the alkoxyaniline with phenyldicyandiamide in acid solution to form the desired biguanide as the acid addition salt, the improvement which comprises: carrying out steps (a) and (b) in situ in the same solvent selected from the group consisting of dimethylformamide, methylpyrrolidone, dimethylsulfoxide and toluene.

4,224,246

PROCESS FOR THE SYNTHESIS AND SEPARATION OF THE THREO AND ERYTHRO ISOMERS OF 2-AMINO-1-PHENYL-1-PROPANOL

Edward B. Hodge, Terre Haute, Ind., assignor to International Minerals and Chemical Corporation, Terre Haute, Ind.

Continuation-in-part of Ser. No. 743,813, Nov. 22, 1976, abandoned. This application Jun. 12, 1978, Ser. No. 914,269

Int. Cl.³ C07C *85/11*

U.S. Cl. 260—570.6 **9 Claims**

1. A process for the separation of a mixture of the erythro and threo isomers of 2-amino-1-phenyl-1-propanol obtained by the process of reducing 2-nitro-1-phenyl-1-propanol in the presence of acetic acid, thereby forming a reaction mixture containing the erythro and threo isomers of 2-amino-1-phenyl-1-propanol acetate salt, and separating the isomeric salt mixture, comprising the steps of:

(a) forming a concentrated solution of the mixture of isomers in hot lower alkyl alcohol,

(b) cooling at reduced temperature thereby forming crystalline threo 2-amino-1-phenyl-1-propanol acetate salt and separating same from the mother liquor containing the erythro isomer,

(c) acidifying the mother liquor from step (b),

(d) reducing volume of mother liquor to about one third,

(e) adding a mixture of lower alkyl alcohol and lower alkyl acetate, and

(f) cooling the mixture thereby resulting in formation of the crystalline salt of erythro 2-amino-1-phenyl-1-propanol.

4,224,247

RECOVERY OF PARA-AMINOPHENOL

Roland G. Benner, New Providence, N.J., and Paul D. Henson, Roanoke, Va., assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Nov. 8, 1978, Ser. No. 958,868

Int. Cl.² C07C *91/44*

U.S. Cl. 260—575 **12 Claims**

1. An improved method for the recovery of para-aminophenol from an aqueous acidic solution thereof obtained by the catalytic hydrogenation of nitrobenzene which comprises neutralizing the crude acidic solution at a temperature sufficiently low whereby the para-aminophenol precipitates as a fluffy precipitate, admixing an aromatic amine with the neutralized solution to form an upper layer comprising the para-aminophenol precipitate suspended in the aromatic amine and a lower aqueous layer, and then separating the upper layer from the lower layer.

4,224,248

PROCESS FOR THE DEPYROPHORIZATION OF PYROPHORIC METAL CATALYSTS AND USES THEREOF

Udo Birkenstock, Ratingen, and Josef Haydn, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 806,238, Jun. 13, 1977, Pat. No. 4,176,092. This application Oct. 17, 1978, Ser. No. 953,227

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713373

Int. Cl.² C07C *85/11, 85/12*

U.S. Cl. 260—580 **6 Claims**

1. A process for the hydrogenation of an organic compound which comprises contacting said organic compound with a non-pyrophoric, highly active metal catalyst requiring essentially no pre-activation, and, prepared from a pyrophoric metal catalyst by treating a suspension of the pyrophoric metal catalyst in water and/or an organic solvent with an organic nitro compound or a nitroso compound at elevated temperature and pressure and separating the hydrogenated organic compound from the reaction medium.

4,224,249

TOLUENE DIAMINE FROM NON-WASHED DINITROTOLUENE

Nance D. Kunz, Bethlehem; Thomas A. Johnson, Orefield, and Barton Milligan, Coplay, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 14, 1979, Ser. No. 38,976

Int. Cl.² C07C *85/11, 85/26*

U.S. Cl. 260—580 **5 Claims**

1. In a process for preparing toluene diamine which comprises reacting dinitrotoluene with hydrogen in the presence of a hydrogenation catalyst, the improvement for permitting reaction of the crude dinitrotoluene feedstock without alkaline treatment with hydrogen which comprises:

(a) water washing the crude feedstock to reduce the acid concentration in the feedstock to less than 6000 ppm;

(b) continuously introducing dinitrotoluene and hydrogen to a reaction vessel;

(c) maintaining the concentration of dinitrotoluene in a range from about 0.0001 to 25% by weight;

(d) maintaining a hydrogenation catalyst concentration of from about 0.1 to 20% based on the weight of reactor contents; and

(e) utilizing a hydrogenation catalyst containing a metal selected from a group consisting of molybdenum, nickel, cobalt, chromium, iron and mixtures thereof.

4,224,250

NOVEL FABRIC CONDITIONING COMPOUNDS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 517,577, Oct. 23, 1974, Pat. No. 4,049,557, which is a continuation-in-part of Ser. No. 272,388, Jul. 17, 1972, abandoned. This application Jun. 2, 1977, Ser. No. 802,933

Int. Cl.² C07C *83/00, 87/16*; D06M *13/38*

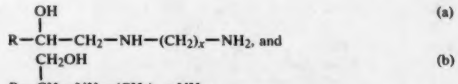
U.S. Cl. 260—584 R **4 Claims**

1. The product of the reaction of at least one mole of an alkanediamine of the formula

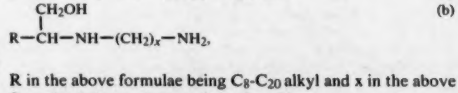
$$H_2N(CH_2)_xNH_2$$

with one mole of an alkyl -1,2-epoxide of the formula

said product being predominantly a compound or mixture of compounds selected from the group consisting of those of the formulae



(a)



(b)

R in the above formulae being C_8-C_{20} alkyl and x in the above formulae being an integer from 2 to 12.

4,224,251

PREPARATION OF 5-DIETHYLAMINOPENTAN-2-OL

Herbert Mueller; Herbert Toussaint, both of Frankenthal, and Arnold Wittwer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1979, Ser. No. 57,085

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1978, 2836831

Int. Cl.[2] C07C *85/24*

U.S. Cl. 260—584 R 4 Claims

1. A process for the preparation of 5-diethylaminopentan-2-ol by catalytically hydrogenating 1-diethylaminopent-2-yn-4-ol, wherein the catalyst used is nickel in the presence of an effective amount of a basic alkali metal compound or alkaline earth metal compound, and water is substantially excluded.

4,224,252

PRODUCTION OF PINACOLONE

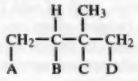
Sunao Kyo; Haruo Tsuchiya, and Hidetsugu Tanaka, all of Kashima, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 15, 1979, Ser. No. 39,300

Int. Cl.[2] C07C *45/02*

U.S. Cl. 568—388 37 Claims

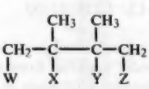
1. A process for producing pinacolone comprising reacting a compound of the general formula (I)



(I)

wherein either any adjacent two of A, B, C and D form a single bond between them and the remaining two are hydrogen atoms, or both A and D are hydrogen atoms and one of B and C is a hydrogen atom and the other is OH, Cl, Br, HSO_4, H_2PO_4 or ClO_4, with formaldehyde in the presence of an aqueous solution of an inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid and perchloric acid, and a salt of one or more of said inorganic acids having a solubility of at least 35 grams per hundred grams of water at 100° C.

24. A process for producing pinacolone from a compound of the general formula (II)



(II)

wherein either both W and Y are hydrogen atoms and X and Z are the same or different and each represents OH, Cl, Br, HSO_4, H_2PO_4, ClO_4 or RCOO in which R is a hydrogen atom or an alkyl group of 1 to 3 carbon atoms, or one of W and Y is a hydrogen atom and the other forms a single bond together with X, and Z represents OH, Cl, Br, HSO_4, H_2PO_4, ClO_4 or RCOO,

comprising heating said compound of the general formula (II) in an aqueous solution of an inorganic acid selected from the group consisting of hydrochloric acid, hydrobromic acid, sulfuric acid, phosphoric acid and perchloric acid.

4,224,253

NOVEL BICYCLIC SCENTS

Manfred Baumann, Mannheim, and Werner Hoffmann, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

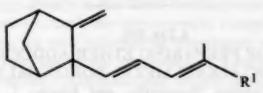
Filed Aug. 28, 1978, Ser. No. 937,267

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1977, 2742185

Int. Cl.[2] C07C *33/05, 47/34, 121/48, 69/74*

U.S. Cl. 568—445 3 Claims

1. A compound of the formula I



(I)

where R^1 is —CH_2OH or —CHO.

4,224,254

PREPARATION OF AROMATIC AND ARALIPHATIC ALDEHYDES

Wolfgang Sauer, Mannheim; Werner Fliege, Otterstadt; Christian Dudeck, Limburgerhof, and Norbert Petri, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 28, 1979, Ser. No. 24,830

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1978, 2817496

Int. Cl.[2] C07C *45/16*

U.S. Cl. 568—431 12 Claims

1. A process for the continuous preparation of aromatic and araliphatic aldehydes by oxidizing araliphatic alcohols in the presence of a metal catalyst at an elevated temperature, wherein an araliphatic alcohol is oxidized with oxygen at from 450° to 700° C. in the presence of silver crystals of particle size from 0.1 to 2.5 millimeters.

4,224,255

PROCESS FOR THE PRODUCTION OF ALDEHYDES AND ALCOHOLS FROM OLEFINICALLY UNSATURATED COMPOUNDS BY HYDROFORMYLATION WITH SUPPRESSION OF OLEFIN HYDROGENATION

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Pittsfield, Mass.

Filed Jun. 15, 1978, Ser. No. 915,767

Int. Cl.[2] C07C *45/10*

U.S. Cl. 568—451 18 Claims

1. In a process for preparing aldehydes and alcohols by contacting an olefinically unsaturated compound having two to twenty carbon atoms, carbon monoxide and hydrogen with a hydroformylation catalyst, the improvement which comprises adding an acidic compound selected from the group consisting of mono- and polycarboxylic acids and inorganic acids to the reaction mixture in an amount at least sufficient to suppress hydrogenation of said olefinically unsaturated compound, said acidic compound having an acid strength at least strong enough to suppress hydrogenation but not so strong as to significantly decompose said aldehyde and alcohol products and sufficient to provide a pKa of from about 1.5 to about 5.0, and carrying out said reaction at a pressure in the range from atmospheric to 10,000 psig and a temperature in the range from about 10° to about 250° C.

18. In a process for preparing aldehydes and alcohols by contacting (1) an olefinically unsaturated compound selected from among alkenes, alkyl alkenoates, alkenyl alkanoates, alkenyl alkyl ethers, alkenols and mixtures thereof, said compounds having two to 20 carbon atoms, (2) carbon monoxide and (3) hydrogen with (4) a hydroformylation catalyst comprising a metal selected from rhodium, ruthenium, cobalt,

platinum or mixtures of any of these, alone, or in complex combination with carbon monoxide, wherein the mole ratio of hydrogen to carbon monoxide is in the range of from 0.1 to 10, at a temperature between about 25° C., and 200° C., and a pressure in the range of 300–1200 psi, the improvement comprising adding an acidic compound selected from the group consisting of phthalic acid and related compounds and phosphoric acid, in an amount at least sufficient to suppress hydrogenation of the olefinically unsaturated compound but not significantly decompose the product aldehydes and alcohols, said acidic compound being sufficient to provide a pKa of from about 1.5 to about 5.0.

4,224,256

METHOD OF PREPARING ETHER ADDUCTS OF ORGANIC-ALKALI METAL-BORON SALTS

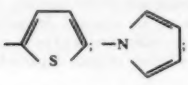
Lawrence P. Klemann, Somerville, and Eugene L. Stogryn, Edison, both of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Apr. 30, 1979, Ser. No. 34,578
Int. Cl.[2] C07F 5/02
U.S. Cl. 568—6 **9 Claims**

1. A method of preparing an ether adduct of alkali metal salt of the formula:

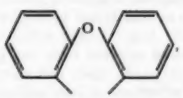
$$ZBAr_mR_nAr_x'$$

wherein Z is an alkali metal selected from the group consisting of Li and Na, wherein B is boron, wherein Ar is an organic radical selected from the group consisting of $-C_6H_5$; $C_6H_4-p-CH_3$; $-C_6H_4-p-F$; $-C_6H_4-m-F$; $-C_6H_4-p-CF_3$; $-C_6H_4-m-CF_3$; $-C_6H_4-o-CF_3$;



$-C_6F_5$, wherein R is an organic radical selected from the group consisting of $-CH_3$ and $-C_2H_5$ wherein Ar' is an organic radical selected from the group consisting of

and



wherein m is a numerical value such that $0 \leqq m \leqq 4$, wherein n is a numerical value such that $0 \leqq n \leqq 2$, and wherein x is a numerical value such that $0 \leqq x \leqq 2$, subject to the proviso that the sum of m and n and x is such that the total valence of the organic radicals Ar, R and Ar' equals four, comprising:

reacting a nitrogen-containing compound of the formula:

$$QHBAr_mR_nAr_x'$$

wherein Q is selected from the group consisting of NH_3; $N(CH_3)_3$, $HN(CH_3)_2$; H_2NCH_3; $N(C_2H_5)_3$; $HN(C_2H_5)_2$and $H_2NC_2H_5$and wherein all other variables are as defined above, with an alkali metal compound of the formula:

ZX

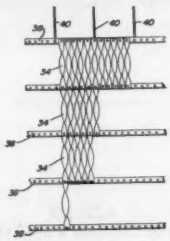
wherein Z is as defined above and wherein X is selected from the group consisting of H; NH_2; $N(CH_3)_2$; $HNCH_3$; $N(C_2H_5)_2$; HNC_2H_5; $N(-CH(CH_3)_2)_2$; any Ar as defined above and any R as defined above, in ether solvent.

4,224,257

COOLING TOWER CONSTRUCTION AND FILL

Elbert W. Robinson, 223 Amarillo Bldg., Amarillo, Tex. 79101

Filed Apr. 19, 1979, Ser. No. 31,632
Int. Cl.[2] B01F 3/04
U.S. Cl. 261—23 R **13 Claims**



1. In a cooling tower having a liquid inlet, a liquid cooling region, a fan in communication with said cooling region for causing air flow within said cooling region, and a liquid spray header connected to said inlet for spraying liquid within said region; fill material disposed beneath said header, said fill material comprising a plurality of individual substantially flat fill elements disposed in a three dimensional array having laterally spaced fill elements, each of said fill elements being elongated and normally twisted about its longitudinal axis, with each fill element being in direct, open liquid transfer relation with each laterally spaced surrounding element to permit liquid and air to travel between said each fill element and said surrounding elements in said array.

4,224,258

METHOD AND APPARATUS FOR PRODUCING SPHERICAL PARTICLES OF UNIFORM SIZE OF NUCLEAR FUELS OR BREEDER MATERIALS

Hans Langen, Jülich; Paul Naefe, Aachen, and Helmut Ringel, Niederzier-Hambach, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

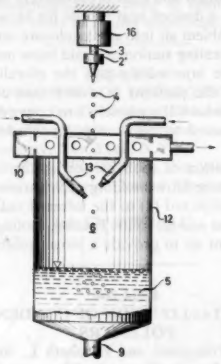
Filed Nov. 28, 1978, Ser. No. 964,284
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1977, 2753503
Int. Cl.[2] G21C 21/00
U.S. Cl. 264—0.5 **8 Claims**

1. A method of producing spherical particles of uniform size of a nuclear fuel or breeder material from drops of a water solution of nitrates of uranium, plutonium or thorium or mixtures of two or more of said nitrates, in which method said solution is subdivided into drops with the aid of a vibrator, and said drops are caused to fall into a water solution of ammonia after passing through a first space occupied by a gas medium free of ammonia for a sufficient distance for the formation of spherical drops and then passing through a second space containing ammonia gas for fixing the spherical shape of the drops by surface hardening, and after immersion in the ammonia solution the resulting oxide spheres are dried and sintered, comprising the improvement which consists in that:

the ammonia gas is introduced into said second space in a stream directed at the drops of said solution in a direction oblique to their direction of movement and with a compo-

nent of motion in the direction movement of said drops of said solution.

5. An apparatus for the production of spherical particles of uniform size of a nuclear fuel or breeder material from drops of a water solution of nitrates of uranium, plutonium or thorium or mixtures of two or more of said nitrates, comprising a first container (1) for a precipitation bath of a water solution of ammonia and an overlying volume of a gaseous ammonia phase, at least one second container (15) for said nitrate solution equipped with a nozzle for dispensing drops of said solution, and a supply conduit system for the ammonia gas, and further comprising the improvement which consists in that:



said supply conduit system for the ammonia gas comprises at least one nozzle (11,13) so disposed with respect to said nozzle (2) of said second container (15) that the ammonia gas is introduced into said volume of space (6) overlying said ammonia solution (5) in said first container (1,12) in a stream directed at the drops of said solution formed by said nozzle (2,2') of said second container (15,16) in a direction oblique to the direction of movement of said drops at the place of meeting them and with a component of motion in their said direction of movement.

4,224,259

MANUFACTURE OF FIBRIDS FROM POLYMERS

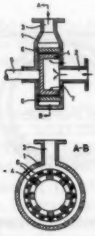
Bruno Sander, Ludwigshafen; Eckhard Bonitz, Frankenthal, and Kurt Scherling, Hemsbach, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 674,149, Apr. 6, 1976, abandoned. This application Sep. 18, 1978, Ser. No. 944,644

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1975, 2516561

Int. Cl.³ B29C *6/00*

U.S. Cl. 264—11 **3 Claims**



1. In the process for the manufacture of fibrids in a single step, which fibrids have a length of from 0.5 to 30 mm, a thickness of from 0.5 to 10μ, a specific surface area of from 10 to 70 m^2/g, and a Schopper-Riegler freeness of from 15° to 50°SR, said process comprising introducing a solution of an amorphous or only slightly crystalline polymer or copolymer of one of the monomers styrene, vinyl chloride, or vinylidene chloride at room temperature into a fibrid-forming zone of a fluid precipitation medium under the action of shearing forces in said zone, the concentration of said polymer or copolymer in said solution being in the range of 0.5 to 30% by weight, said shearing forces being generated by forcing a said solution through one or more nozzles at a flow rate of at least five m/sec into said fluid precipitation medium and thereby thoroughly mixing the solution of said polymer or said copolymer with said fluid precipitation medium, and generating by said forcing of said solution into said fluid precipitation medium a mean energy density in the fibrid-forming zone in the range of 5 to 30 watt-sec/cm^3, the improvement comprising the use as the solvent for said polymer or copolymer of a compound selected from the group consisting of methyl ethyl ketone, tetrahydrofuran, 1,4-dioxane and the use of water as the fluid precipitation medium.

4,224,260

PRODUCTION OF METAL POWDER

Richard J. Dain, Borough Green, and Peter R. Brewin, Weald, both of England, assignors to Powdrex Limited, London, England

Continuation of Ser. No. 789,915, Apr. 22, 1978, abandoned. This application Feb. 12, 1979, Ser. No. 11,721

Claims priority, application United Kingdom, Apr. 23, 1976, 16498/76

Int. Cl.² B01J *2/06*

U.S. Cl. 264—11 **9 Claims**

1. A method of making metal powder having a relatively low oxygen content and irregularly shaped particles from molten metal comprising:

(a) forming a falling stream of molten metal;

(b) impinging a jet of an atomizing liquid upon the falling metal stream to atomize said molten stream into molten metal droplets;

(c) quenching said droplets with a quench liquid to rapidly cool and quickly solidify said droplets; and

(d) including in at least one of the atomizing and quench liquids an anti-foaming agent to reduce foaming around said molten metal droplets and to increase the rate of cooling of said metal droplets.

4,224,261

METHODS OF FABRICATING MICROSPONGE DEUTERATED INITIATED HYDROCARBON POLYMER TARGET WHICH EMIT NEUTRONS WHEN IRRADIATED BY HIGH ENERGY BEAMS

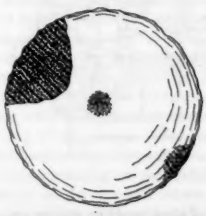
Gerald M. Halpern, Sommerville, N.J., assignor to The University of Rochester, Rochester, N.Y.

Filed Oct. 11, 1977, Ser. No. 841,171

The portion of the term of this patent subsequent to May 30, 1995, has been disclaimed.

Int. Cl.² B29C *23/00;* **B29D** *27/00*

U.S. Cl. 264—15 **4 Claims**



1. A method for the fabrication of elements, for use as targets

for a high energy beam, and which provide neutrons by interaction with said beam, said method comprising the steps of

(a) forming deuterated hydrocarbon polymer material into solid bodies which are of sizes which are less than about 300 microns diametrically,

(b) cross linking the molecules of the material with radiation,

(c) increasing the size of said linked bodies while reducing the mass thereof with the aid of a fluid which is a solvent for the uncross linked portions of the material and a swelling agent for the cross linked portions thereof which causes said bodies to partially dissolve and to swell, thereby providing said bodies with a micro-sponge structure of cells of a size which does not exceed about one micron, said micro-sponge structure bodies providing said elements, and

(d) exposing said micro-sponge structure bodies to tritium gas whereby to exchange a portion of the deuterium of said material for tritium such that said bodies are of deuterated tritiated polymer material.

4,224,262

CROSSLINKED COPOLYMER OF AN OLEFIN AND VINYL ALCOHOL

William G. Baird, Jr., Spartanburg, and LeRoy Pike, Inman, both of S.C., assignors to W. R. Grace & Co., Duncan, S.C.

Filed Aug. 7, 1978, Ser. No. 931,634

Int. Cl.[2] B29C *25/00*; C08F *8/12*

U.S. Cl. 264—22 **12 Claims**

1. A process for forming a film of a crosslinked copolymer of an olefin and vinyl alcohol comprising the steps of:

providing a precursor film comprised of a copolymer of said olefin and a vinyl ester, said copolymer having from 10 to 90 mole percent of said olefin and said vinyl ester;

irradiating said precursor film to form a crosslinked precursor film; and

hydrolyzing said crosslinked precursor film to produce said film of a crosslinked copolymer of an olefin and vinyl alcohol.

4,224,263

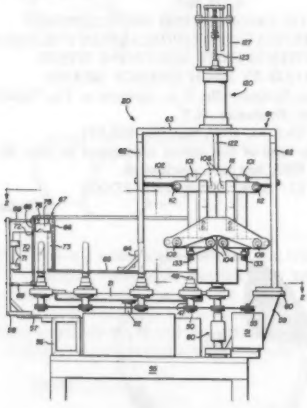
METHOD FOR BLOW MOLDING

Robert F. Kontz, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Mar. 14, 1978, Ser. No. 886,488

Int. Cl.[2] B29C *17/07*

U.S. Cl. 264—25 **3 Claims**



1. In a method of blow molding plastic articles from heated thermoplastic parisons, the steps of:

(1) conveying a plurality of parisons in succession through an enclosure defining a path of travel traversing successive, equally spaced work stations including successive radiant heating stations and a subsequent blow molding station, while rotating each parison except at said blow molding station;

(2) temporarily interrupting said conveying along said path of travel at each successive radiant heating station while still continuing rotating such parisons;

(3) conveying the parisons serially from the last radiant heating station to said blow molding station;

(4) exposing each parison at each radiant heating station to infrared radiation and thus progressively providing each parison with a desired heat profile for blow molding;

(5) injecting ambient air into said enclosure intermediate the last radiant heating station and said blow molding station;

(6) blowing the injected air past the plurality of heating stations and the parisons in a direction counter to the direction in which the parisons are conveyed, each parison being heated to blow molding temperature by the radiation;

(7) ceasing rotation of each parison at the blow molding station and there blow molding each parison in turn after it has been subjected (1) to the infrared radiation at each heating station and (2) to the heating-cooling effect of the countercurrent air to provide a blown plastic article.

4,224,264

FOAM CRYSTALLIZATION OF CONDENSATION POLYMERS

Morris R. Ort, Wilbraham, and Elizabeth L. Newell, Springfield, both of Mass., assignors to Monsanto Company, St. Louis, Mo.

Filed Jan. 18, 1979, Ser. No. 4,433

Int. Cl.[2] B29D *27/00*

U.S. Cl. 264—54 **35 Claims**

1. A process for crystallizing a crystallizable linear polyester which comprises dispersing a chemical blowing agent in the molten polyester, extruding the molten polyester to form a solid closed cell foam and maintaining the solid foam at a temperature above the glass transition temperature of the polyester until crystallization occurs and the crystallized polyester has a heat of fusion in the range of about 12 to about 40 J/g.

4,224,265

TANK, PARTICULARLY OIL TANK

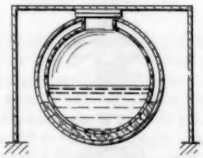
Hans-Peter Pfisterer, Beihingerstr.146, Benningen, Fed. Rep. of Germany (D-7141)

Filed Dec. 21, 1977, Ser. No. 862,682

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1976, 2658971

Int. Cl.[2] B28B *1/16*

U.S. Cl. 264—71 **5 Claims**



1. The method of forming a substantially spherical tank using a closed mold of separable mold parts, said method comprising the steps of: inflating a spherical balloon; applying a coating of glass reinforced fiber material over the surface of said balloon; letting said glass rinforced fiber material harden to form a rigid inner container of limited strength, and removing it from said inner container; attaching a manhole cover to said inner container to render the inner container watertight;

suspending said inner container from said cover; assembling a plurality of mold parts around said rigid inner container; the assembled mold being spaced from said rigid inner container; partially filling said inner container with water up to a predetermined level; adding fluid concrete into the space between said inner container and said mold at least substantially sufficient to provide buoyancy to overcome the weight of said inner container and said water area; the buoyancy counteracted by the rigidity of said inner container and said cover; then substantially filling said inner container completely with water; filling the remainder of the space between said inner container and said mold with concrete; allowing said concrete to set; and disassembling said mold to remove the resultant concrete jacketed inner container therefrom.

4,224,266

MANUFACTURE OF DETERGENT BARS

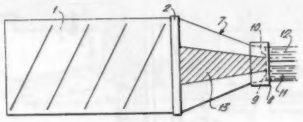
Leslie Hunt, Wirral; Ian T. Nicolson, Birkenhead, and Thomas M. Whitfield, Wirral, all of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Sep. 18, 1978, Ser. No. 943,599

Claims priority, application United Kingdom, Sep. 26, 1977, 39975/77

Int. Cl.³ B29F *3/12*

U.S. Cl. 264—75 **11 Claims**



1. A method of injecting liquid into a detergent mass wherein a detergent mass is passed through a single screw extruder and apertured areas of apertured pressure plate means, carrying a non-apertured area between the apertured areas, into a common extrusion cone which terminates at a twin apertured extrusion plate and liquid is injected within or immediately downstream of each of the apertured areas, characterised in that a partition is provided extending downstream from the unapertured area to separate the detergent mass into two streams.

8. Detergent processing apparatus suitable for the injection of liquid in a detergent mass comprising:

a single screw extruder,

a common extrusion cone into which the extruder opens,

a twin apertured extrusion plate at the termination of the extrusion cone, apertured pressure plate means, carrying an unapertured area between two apertured areas, between the extruder and the extruder cone,

liquid injection means positioned within or immediately downstream of each apertured area, and

a partition extending downstream from the unapertured area,

the side surfaces of the partition forming, together with the inner surfaces of the extrusion cone, separate compression means for each detergent stream.

4,224,267

WIRE, ROD, STICK, AND THE LIKE, WITH OR WITHOUT FLUXING AGENT FOR WELDING APPLICATIONS

Robert Lugosi, Monroeville; Gerald G. Lessmann, Pleasant Hills; Alan T. Male, Murrysville, and Richard A. LaFave, Monroeville, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 28, 1978, Ser. No. 891,089

Int. Cl.² B22F *1/00*

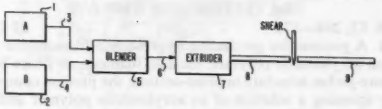
U.S. Cl. 264—111 **3 Claims**

1. A consumable electrode of predetermined length and cross-section obtained as a staple article by the following steps:

selecting particulated metals, said metals being constituents of an alloy system suitable for a predetermined welding process;

adding and blending said particulated metals in proportions defined by said alloy system;

extruding and conforming the blended particulated metals to said predetermined cross-section and for said predetermined length under a mechanical pressure sufficient to generate a bendable composite unitary body having defi-



nite mechanical characteristics in several directions including mechanical strength and ductility;

said steps being short of any heating process and of any chemical union of any of the particulated metals whereby said composite body is obtained as a staple article of said length and cross-section which is susceptible when used as a consumable electrode of yielding in situ under said welding process an alloy conforming to said alloy system.

4,224,268

PNEUMATIC TIRES HAVING ORNAMENTED SIDEWALLS, AND THEIR MANUFACTURE

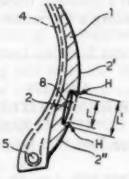
Claudio Merli, Cormano, and Carlo Francia, Monza, both of Italy, assignors to Euteco S.p.A., Milan, Italy

Filed Oct. 18, 1977, Ser. No. 843,307

Claims priority, application Italy, Nov. 19, 1976, 29539 A/76

Int. Cl.² B29H *5/02*; B29D *3/00*

U.S. Cl. 264—139 **1 Claim**



1. A method for manufacturing a tire casing having decorative material of a contrasting color on the sidewall thereof comprising applying and securing a thin layer of a decorative elastomer in the desired location on the black elastomer of the sidewall of a raw tire casing, said decorative elastomer having a color different from the black sidewall and having a width greater than the desired decoration, simultaneously forcing at least a part of said layer lying within the margins of the layer into the thickness of the elastomer forming the body of the sidewall of said raw tire casing and molding a recess having a dovetail cross-sectional configuration and an outline in the form of the desired decoration into the body of the sidewall of said raw tire casing with the decorative elastomer covering the bottom surface only of the recess, vulcanizing said raw tire casing and said decorative elastomer and removing the residual decorative elastomer remaining on the surface of the sidewall about the periphery of the dovetail recess which has been molded into the outer face of the sidewall of the casing and which has the entire bottom surface thereof covered with said decorative elastomer.

4,224,269

PROCESS FOR SPINNING HYGROSCOPIC FILAMENTS AND FIBERS

Ulrich Reinehr; Toni Herbertz, both of Dormagen, and Hermann-Josef Jungverdorben, Grevenbroich, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 16, 1978, Ser. No. 887,212

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1977, 2713456

Int. Cl.[2] **D01F** *6/18;* **B29F** *3/10*

U.S. Cl. 264—171 **12 Claims**

1. A process for producing hygroscopic filaments or fibers of an acrylonitrile polymer, the said filaments or fibers having a core-jacket structure in cross-section; the process comprising dry spinning a solution of an acrylonitrile polymer and, at a time after the filament or fiber has issued from the spinning jet and before the filament or fiber has completely solidified, subjecting the filament or fiber to water vapor or the vapor of a liquid other than water which coagulates the filament or fiber.

4,224,270

COATED POLYESTER FILMS

Gordon E. A. Pears, Harpenden, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 706,287, Jul. 19, 1976, abandoned, which is a division of Ser. No. 257,297, May 26, 1972, abandoned, which is a division of Ser. No. 52,763, Jul. 6, 1970, abandoned. This application Oct. 26, 1978, Ser. No. 954,773

Claims priority, application United Kingdom, Jun. 29, 1970, 35556/70

The portion of the term of this patent subsequent to Jun. 25, 1991, has been disclaimed.

Int. Cl.[2] **B29C** *29/00*

U.S. Cl. 264—171 **12 Claims**

1. A process for the production of a film comprising a synthetic linear polyester which process comprises extruding a polymeric composition through a film-forming extruder wherein the polymeric composition comprises (a) fresh synthetic linear polyester and (b) a polymer containing material derived from a film of a synthetic linear polyester coated with a composition comprising a thermoset acrylic or methacrylic material.

4,224,271

PROCESS FOR BICONSTITUENT POLYMER COMPOSITIONS

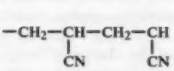
Woon W. Tse, 204 Nga Tsin Wai Rd. 12F, Hong Kong, Hong Kong

Division of Ser. No. 387,238, Aug. 10, 1973, abandoned. This application Nov. 25, 1975, Ser. No. 635,137

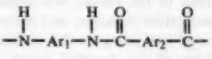
Int. Cl.[2] **D01F** *6/00*

U.S. Cl. 264—184 **7 Claims**

1. A method for producing polymer textile filaments comprising the steps of cutting into fine particles as a major constituent a polyacrylonitrile polymer containing recurring structural units of formula,



and as the minor constituent an aromatic polyamide containing recurring structural units of formula,



wherein Ar_1 and Ar_2 are the same or different substituted or unsubstituted divalent aromatic radicals, adding a solvent of dimethyl formamide containing a solubility promoter to the particles to provide a spinning dope, deaerating the dope and then forcing the dope through a spinneret and into a coajulant containing bath in order to extract the solvent, thereafter drawing the resulting filament through a steam bath and finally exposing the filament to heat of at least 165° C. for about one second to increase the tenacity and break elongation of the filament.

4,224,272

BLOW-MOLDING NOZZLE AND METHOD

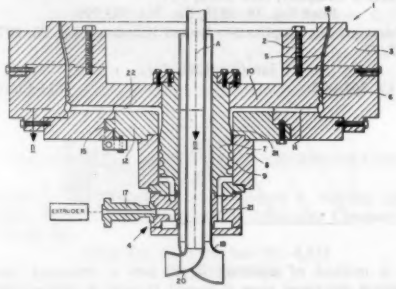
Josef Klein, Troisdorf-Sieglar, Fed. Rep. of Germany, assignor to Reifenhäuser KG, Troisdorf, Fed. Rep. of Germany

Filed Nov. 24, 1978, Ser. No. 963,172

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1977, 2752932

Int. Cl.[2] **B29F** *3/04*

U.S. Cl. 264—209 **7 Claims**



1. A nozzle assembly comprising:

an upstream mold part forming a generally annular small-diameter upstream mold passage generally centered on an axis;

upstream guide means in said upstream passage for imparting rotation about said axis to at least a part of a fluid mass flowing through said upstream passage;

an upstream distributor mounted on said upstream part and oriented to deflect the mass issuing from said upstream passage radially outwardly;

a throttle ring mounted on said distributor and having a plurality of generally angularly equispaced and radially extending substantially cylindrical throttle passages each having an inner end receiving the fluid mass from said distributor and an outer end;

a downstream part forming a generally annular large-diameter downstream passage generally centered on said axis having an annular intake end at said outer ends of said throttle passages and an outlet; and

downstream guide means in said downstream passage for imparting rotation about said axis to at least a part of the fluid mass flowing through said downstream passage, whereby said mass issues from said outlet as a large-diameter homogeneous tube.

6. A method of making a homogeneous large-diameter tube from a continuous extruded solid strand of a thermoplastic synthetic resin, said method comprising the steps of continuously and concomitantly:

forming said solid strand into a small-diameter upstream tube section centered on an axis and flowing said upstream tube section along said axis;

imparting to at least a portion of the material of said upstream tube section a rotation about said axis;

deflecting said upstream tube section at its downstream end radially outwardly;

subdividing the radially outwardly deflected section into a

plurality of radially outwardly flowing separate, substantially cylindrical, and solid streams;

uniting said streams into a large-diameter downstream tube section and flowing same axially;

imparting to at least a portion of the material of said downstream tube section a rotation about said axis; and

expelling said downstream tube section at its downstream end as a large-diameter tube into the atmosphere.

4,224,273

METHOD OF MANUFACTURING A LAMINATED ROTARY ANODE FOR USE IN AN X-RAY TUBE

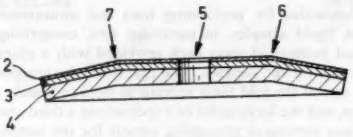
Frederik Magendans, and Bernhard J. P. van Rheenen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 621,484, Oct. 10, 1975, abandoned, which is a continuation of Ser. No. 418,581, Nov. 23, 1973, abandoned. This application May 22, 1978, Ser. No. 907,991

Claims priority, application Netherlands, Dec. 7, 1972, 7216588

Int. Cl.[2] **H01J** *35/04*

U.S. Cl. 264—259 **19 Claims**



1. Method of manufacturing a laminated X-ray anode comprising:

(a) forming a preliminary unitary workpiece by laminating a first electron target layer of a first tungsten alloy to a second layer of a material being one of tungsten or a second tungsten alloy, said second layer being a material having a lower yield point than that of said first layer;

(b) providing a support member of a material being one of molybdenum or a molybdenum alloy;

(c) joining said workpiece to said support member by attaching said second layer to said support member in a high rate impact forming process, said step simultaneously increasing respective transverse dimensions of said workpiece and said support member, and reducing respective thicknesses of said workpiece and said support member; and

(d) shaping the resulting assembly into a desired anode form.

4,224,274

METHOD FOR MANUFACTURE OF CONCRETE PRODUCTS

Seiichi Ozawa, Tokyo, Japan, assignor to Ozawa Concrete Industry Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1978, Ser. No. 951,054

Claims priority, application Japan, Jun. 19, 1978, 53-73157

Int. Cl.[2] **C04B** *13/02*

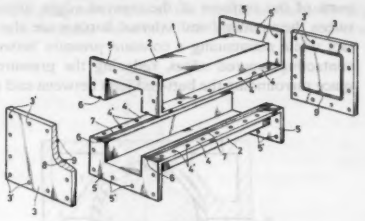
U.S. Cl. 264—333 **5 Claims**

1. A method for the manufacture of concrete products, which comprises the steps of

(a) filling a cavity in a molding frame of a material capable of withstanding elevated temperatures and superatmospheric pressures with fresh concrete mix;

(b) airtightly sealing the cavity of the molding frame filled with the concrete mix; and

(c) heating the molding frame to raise the temperature in the cavity to 150° C. to 220° C. whereby steam generated by the raised temperature in the cavity cures the concrete



mix therein under conditions of elevated temperatures and superatmospheric pressure.

4,224,275

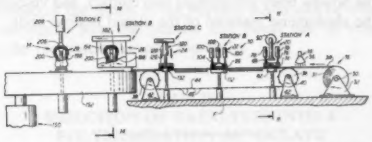
PROCESS FOR MAKING CONTAINERS

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 820,444, Aug. 1, 1977, abandoned, which is a continuation of Ser. No. 615,813, Sep. 22, 1975, abandoned. This application Feb. 1, 1979, Ser. No. 8,607

Int. Cl.[2] **B29D** *9/00;* **B29C** *17/04*

U.S. Cl. 264—516 **10 Claims**



1. In a process for thermoforming a hollow article from a substrate of thermoplastic material, the improvement comprising:

(a) depositing a moldable thermoplastic material in a plastic state on said substrate of thermoplastic material in a limited area to be formed into said article;

(b) thereafter shaping said moldable thermoplastic material on said substrate of thermoplastic material in said limited area to be formed to form a shaped composite section of thermoplastic material;

(c) introducing said shaped composite section into a thermoforming station; and

(d) thermoforming a multilayered hollow article from said shaped composite section of thermoplastic material, said multilayered hollow article having an inner layer of one thermoplastic material and an outer layer of another thermoplastic material.

4,224,276

PROCESS FOR MANUFACTURING CLOSED HOLLOW BODIES IN ELASTOMERIC MATERIAL

Achille Gallizia, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy

Filed Jul. 13, 1978, Ser. No. 924,301

Claims priority, application Italy, Jul. 21, 1977, 25936 A77

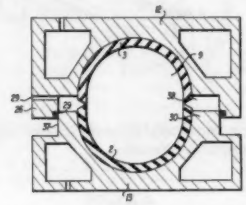
Int. Cl.[2] **B29H** *7/02;* **B29C** *27/02*

U.S. Cl. 264—571 **5 Claims**

1. A process for manufacturing a closed hollow body having an elastomeric wall comprising the steps of:

shaping raw elastomeric material into complementary parts of a closed hollow body having an open side with an elastomeric wall therearound, said complementary parts having a tapered edge tapering towards the outside, butt-end joining said tapered edges of the complementary parts

by partially pressing together said tapered edges starting with the part of said edges which is innermost with respect to the hollow cavity of the closed hollow body until parts of the surfaces of the tapered edges disposed between their internal and external borders are also in contact while maintaining a constant pressure between said contacting tapered edges, reducing the pressure in the space surrounding the butt-end joint between said complementary parts whereby material is moved from the inside towards the outside of the butt-end joint and gas bubble formation in said butt-end joint is prevented, increasing the pressure which forces the tapered edges of the complementary parts together while maintaining a reduced pressure around the butt-end joint until the external border of said tapered edges of said complementary parts of the hollow body are brought into contact, and vulcanizing the elastomeric material of the closed hollow body.



4,224,277

COATED SLIDES AND APPARATUS FOR COATING SAME

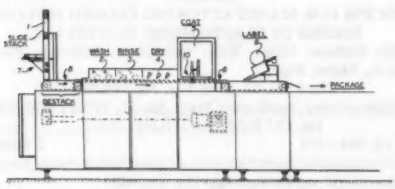
Heinz Macho, Mannheim-Neuostheim; Hans Lange, Lampertheim; Dieter Berger, Viernheim, and Wolfgang Werner, Mannheim-Vogelstang, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Division of Ser. No. 672,574, Mar. 31, 1976, Pat. No. 4,103,041. This application Apr. 24, 1978, Ser. No. 899,666

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1975, 2525869

Int. Cl.[2] G01N *1/28, 1/30;* G02B *21/34*

U.S. Cl. 422—57 **6 Claims**



1. A pre-coated microscope slide comprising a slide and a dyestuff coating thereon sprayed on the slide in the form of individual microfine dyestuff droplets thereon which do not flow together.

4,224,278

APPARATUS FOR PERFORMING TESTS AND MEASUREMENTS ON LIQUID SAMPLES

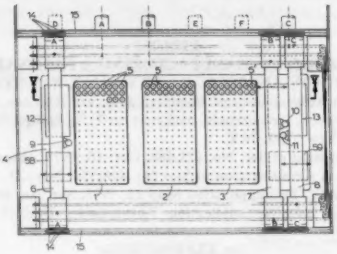
Johannes H. L. Hogen Esch, Aalten, Netherlands, assignor to Vitatron Scientific B.V., Dieren, Netherlands

Filed Apr. 11, 1978, Ser. No. 895,389

Claims priority, application Netherlands, Apr. 22, 1977, 7704460

Int. Cl.[2] G01N *1/14, 1/18*

U.S. Cl. 422—65 **17 Claims**



1. Apparatus for performing tests and measurements on various liquid samples, in particular sera, comprising three identical juxtaposed trays each provided with a plurality of receptacles for the samples to be examined, the receptacles of a first one of the said trays serving as storage vessels for the samples, and the receptacles of a second and a third one of the said trays serving as processing vessels for the samples, and further comprising three stations arranged above the said trays and means for displacing said stations with respect to said trays in all directions in a horizontal plane, the said stations serving for transferring the samples from said first tray to said second and said third tray, for adding reagents, and for discharging reaction products from the receptacles of said second and said third tray.

4,224,279

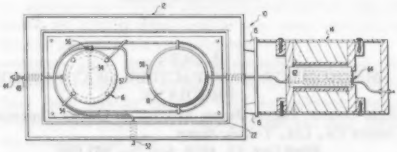
REACTIVE GAS GENERATOR

Wing Tsang, Gaithersburg; James A. Walker, Rockville, both of Md., and Douglas W. Cornell, Glen Rock, N.J., assignors to The United States of America as represented by the Secretary of Commerce, Washington, D.C.

Division of Ser. No. 755,912, Dec. 30, 1976, abandoned. This application Jun. 8, 1978, Ser. No. 913,918

Int. Cl.[3] G01N *1/22, 1/26*

U.S. Cl. 422—78 **11 Claims**



1. A reactive gas generator for use in generating known stable quantities of reactive substances continuously and in dilute, substantially invariant concentrations to permit calibrating of measuring instruments, toxicity measurements and pollutant formation rate measurement, the generator comprising:

diffusion cell means for generating a dilute gaseous mixture of an organic parent compound in an inert diluent, said diffusion cell means comprising a metal diffusion cell for holding said organic parent compound,

heating means to vaporize said organic compound,

a diffusion column in the head of the diffusion cell to allow said parent compound vapor to diffuse from said diffusion cell, a diffusion tee connected to said diffusion column wherein said parent compound vapor is mixed with the diluent gas to form a dilute mixture and tubing to carry said diluent gas from a tank to said diffusion tee where it picks up the parent compound vapor;

further tubing to carry said mixture from said diffusion cell means;

pyrolyzer means coupled to said diffusion cell means by said further tubing to receive the mixture therefrom for producing a complete stoichiometric decomposition of said compound to form said reactive gas; and

means coupled to said pyrolyzer means for allowing exit of the reactive gas therefrom continuously in dilute, substantially invariant concentrations.

4,224,280

CARBON MONOXIDE DETECTING DEVICE

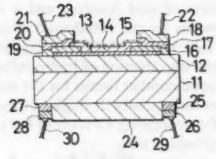
Teizo Takahama, and Toyoki Kazama, both of Kawasaki, Japan, assignors to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Jul. 13, 1978, Ser. No. 924,324

Claims priority, application Japan, Jul. 18, 1977, 52-85917; Jul. 18, 1977, 52-85918

Int. Cl.[2] G01N *27/04*

U.S. Cl. 422—98 **10 Claims**



1. A detector for a carbon monoxide gas comprising:

(a) an insulating substrate;

(b) a first film predominantly of stannic oxide (SnO_2) formed on said insulating substrate, and wherein a donor selected from the group consisting of antimony and bismuth is incorporated into said first film;

(c) a second film predominantly of platinum formed on said first film; and

(d) a film intermediate said first and second film, said intermediate film predominantly comprising stannic oxide and having an acceptor selected from the group consisting of platinum, aluminum, and boron.

4,224,281

DOSAGING DEVICE FOR LIQUID MEDIA

Roland Thieme, Maximiliansau, Fed. Rep. of Germany, and Guido Heyneman, Knokke, Belgium, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

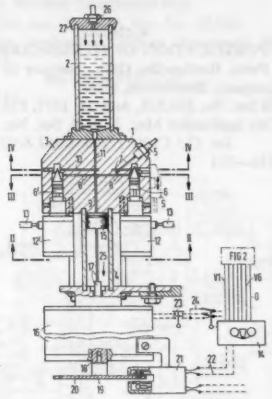
Filed Jan. 18, 1979, Ser. No. 4,372

Claims priority, application Fed. Rep. of Germany, Feb. 1, 1978, 2804316

Int. Cl.[2] G01N *1/14*

U.S. Cl. 422—100 **16 Claims**

1. In a liquid metering and dispensing device having a liquid receptacle in communication with a valve block and a liquid measurement burette having a motor operated piston in communication with the valve block for conveying a determined amount of liquid to the receptacle through the valve block from the burette through the valve block, the improvement of the valve block including a plurality of inlet nozzles and at least one outlet nozzle, each of the inlet nozzles being selectively communicable with the burette via valve block internal passageways, each of the nozzles having a separate controllable first valve associated therewith for opening and closing communication between the inlet and a passageway from the inlet to the burette, burette to receptacle communicating passageways within the valve block controlled by a second controlled valve for selectively communicating the burette to the receptacle, the receptacle being mounted on the valve block and means sensing movement of the burette piston providing a signal which is usable for control of further piston movement



whereby a liquid can be communicated from a selected one of the inlet nozzles to the burette in quantities determined by positioned of the piston in the burette, liquid can be stored in the receptacle from the burette and liquid can be removed from the receptacle through the outlet.

4,224,282

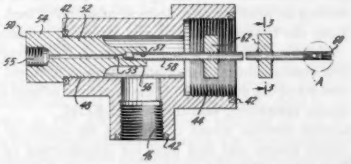
INJECTION OF CATALYSTS INTO A POLYMERIZATION AUTOCLAVE

Robert B. Steinert, Station Island, N.Y., and William A. Schuessler, Rivervale, N.J., assignors to El Paso Polyolefins Company, Paramus, N.J.

Division of Ser. No. 497,977, Aug. 16, 1974, Pat. No. 4,002,813. This application Nov. 8, 1976, Ser. No. 739,394

Int. Cl.[2] B01J *3/04*; F23D *11/16*

U.S. Cl. 422—111 **5 Claims**



1. In a thick-walled high pressure polymerization autoclave equipped for continuous operation including means for continually introducing compressed monomer and polymerization catalyst thereto and for continually removing therefrom a product stream containing polymer and unreacted monomer, the improvement which comprises a composite injector having pressure tight connection means for attachment to an opening through the thick wall of said autoclave said injector comprising a separately enclosed high pressure conduit of relatively small cross-section provided with a catalyst supply inlet tap at its upstream end and terminating in a fine orifice at its downstream end which reaches just to but not beyond the inner wall boundary of said autoclave, a separate pressure-tight annular housing of much larger cross-section surrounding said catalyst conduit and terminating at its downstream end in said connection means and an upstream monomer supply connection into said annular housing.

3. The improvement of claim **1** wherein said autoclave is also

equipped with thermocouples the electrical signals from which are connected to an automatic feed-back control device responsively biased to adjust the catalyst feed rate in such a way as to help steady the operating temperatures within the autoclave.

4,224,283

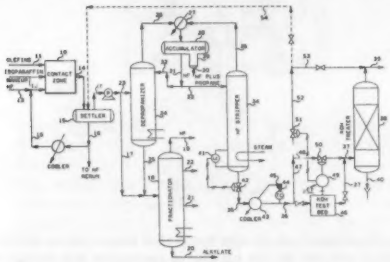
PURIFICATION OF HYDROCARBONS

Mack F. Potts, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 824,125, Aug. 12, 1977, Pat. No. 4,167,531. This application Mar. 2, 1979, Ser. No. 16,780

Int. Cl.[2] C10G *17/00*; B01J *8/02*

U.S. Cl. 422—111 **6 Claims**



1. An apparatus for controlling the separation of HF from hydrocarbons in a manner such that excessive temperature increases above a preselected maximum allowable temperature due to unexpected excess HF are avoided which apparatus comprises, in combination:

a stripping column having an inlet means for introducing feed into an intermediate portion of the column, an overhead outlet for removing materials stripped from the feed, and a bottom outlet for removing stripped feed containing residual amounts of HF,

a vessel means containing solid KOH and having an inlet for introduction of stripped feed removed from the bottom outlet of said stripping column, an overhead outlet for removing KOH-treated feed, and a bottoms outlet for removing sludge,

a test vessel means containing solid KOH used as a test bed having an inlet for introduction of stripped feed removed from the bottom outlet of said stripping column, and an outlet for removing a small stream of KOH-treated feed,

a first conduit means for connecting said bottoms outlet of said stripping column with the feed inlet of said test vessel means containing said test bed of KOH,

a second conduit means connecting the outlet of said test vessel means and said inlet for introduction of stripped feed into said vessel means,

a third conduit means connecting said first conduit means and said second conduit means and by-passing said test vessel means containing said test bed of KOH,

by-pass conduit means connected to said third conduit means,

a first flow control valve in said third conduit means and a second flow control valve in said by-pass conduit means, said first and said second flow control valves being positioned downstream of the junction point of said by-pass conduit means and said third conduit means, and

a temperature-sensing means in said test vessel means connecting said first and said second control valves which are manipulated in response to a preselected maximum allowable temperature within said test vessel means and when this temperature reaches a preselected maximum value said second flow control valve is opened and said first flow control valve is closed.

4,224,284

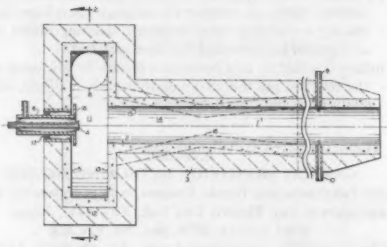
CARBON BLACK REACTOR

Paul J. Cheng, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 498,776, Aug. 19, 1974, abandoned. This application Apr. 12, 1978, Ser. No. 895,430

Int. Cl.[2] C09C *1/50*

U.S. Cl. 422—156 **6 Claims**



1. A carbon black reactor comprising a housing with a tubular-spaced interior from heat resistant material and having an upstream confining wall essentially orthogonal to the longitudinal reactor axis, connected to said upstream confining wall a cylindrical portion of said housing and a downstream end provided with means for the withdrawal of carbon black containing smoke, said reactor further comprising first conduit means for the axial introduction of hydrocarbon feedstock into said housing, second conduit means for the introduction of hot combustion gases tangentially through said cylindrical portion of said housing for generating a vortex of hot combustion gases around said longitudinal axis,

the improvement comprising radial gas flow nozzle means for reducing the pressure drop between the location of introducing said hot combustion gases and said downstream end of said reactor, said radial gas flow nozzle means comprising one or more nozzle openings arranged around said longitudinal axis in said housing in close proximity with said upstream confining wall for directing a gas flow along said upstream confining wall in essentially radially outward direction under the further provision that said openings are arranged within a boundary zone adjacent to said upstream confining wall, said boundary zone extending axially from said upstream confining wall about one-half to one inch.

4,224,285

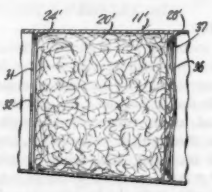
SMOKE FILTER FOR INTERNAL COMBUSTION ENGINES

Edward A. Mayer, Newburgh, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Apr. 5, 1978, Ser. No. 893,561

Int. Cl.[2] F01N *3/15*; B01D *39/10*

U.S. Cl. 422—179 **2 Claims**



1. A smoke filter for use with the exhaust system of an internal combustion engine, comprising

a tapered housing having inlet and outlet pipes coaxially attached thereto and adapted for being connected into said exhaust system,

a mass of alumina coated stainless steel wool filling said housing between said inlet and outlet pipes,

a first spoked wheel having a flat planar configuration and situated transversely across at the smaller end of said tapered housing adjacent to said outlet pipe for holding said mass of steel wool in place,

a second spoked wheel having a maximum diameter less than the transverse dimension of the larger end of said tapered housing to permit longitudinal displacement toward said mass of steel wool,

said second spoked wheel having an unstressed curved configuration,

a flange on the inside surface of said housing at the larger end thereof, and

a convoluted spring located between said flange and the rim of said second spoked wheel for applying a longitudinal bias force against said mass of steel wool,

said tapered housing being circular in cross section and having a minimal degree of taper consistent with developing a radial compressive force on said mass of steel wool sufficient to eliminate channeling of exhaust gases.

4,224,286

REGENERATION EQUIPMENT FOR SPENT ACTIVATED CARBON

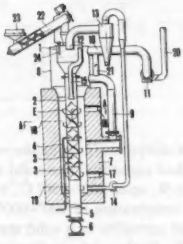
Tamotsu Murase; Shintaro Fujimoto; Yukinori Kasuga; Naoki Takada; Hajime Sasaki, and Nobuo Miwa, all of Ube, Japan, assignors to Ube Industries, Ltd., Japan

Filed Jun. 22, 1978, Ser. No. 918,154

Claims priority, application Japan, Jun. 28, 1977, 52-76123

Int. Cl.[2] B01J *8/00*; C01B *17/82*; F26B *17/12*

U.S. Cl. 422—205 **5 Claims**



1. A regeneration equipment for spent activated carbon, having a regeneration reactor provided vertically through a vertical heating furnace, comprising an integrated body of a longitudinal series of numerous spiral elements fixedly provided almost throughout the length of said regeneration reactor, steam ducts provided so that they are inserted in said regeneration reactor at about the middle portion thereof, and exhaust chambers fixedly provided on the outside surface of the wall of said regeneration reactor, each of said exhaust chambers communicating at its bottom portion with the inside of said regeneration reactor through exhaust holes provided in the wall of said regeneration reactor.

4,224,287

PROCESS FOR THE PREPARATION OF PURE ALUMINUM OXIDE

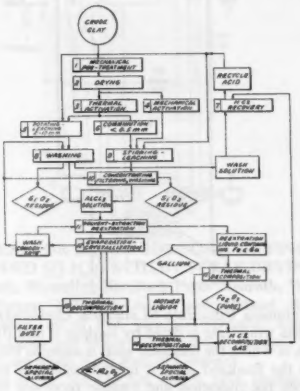
Siegfried Ziegenbalg; Gerhard Fischer; Gerhard Haake, and Rudolf Siebert, all of Freiberg, German Democratic Rep., assignors to VEB Mansfeld Kombinat Wilhelm Pieck, Lutherstadt Eisleben, German Democratic Rep.

Filed Apr. 24, 1979, Ser. No. 32,904

Claims priority, application German Democratic Rep., Apr. 24, 1978, 204962

Int. Cl.[2] C01F *7/22*

U.S. Cl. 423—112 **13 Claims**



1. Process for the preparation of pure aluminum oxide from clay or alumina containing minerals which comprises the steps of: mechanically pretreating the clay by applying sufficient shearing stress thereto to provide clay having a particle size of 2–15 mm; drying the mechanically pretreated clay at a temperature of 130°–250° C. to a residual moisture content not exceeding 3%; thermally actuating the mechanically pretreated clay at a temperature of 600°–800° C.; subjecting the thermally activated clay to leaching with hydrochloric acid having a concentration of 15–25%, wherein the hydrochloric acid is used in an amount of 80–120% of the stoichiometric amount calculated on Al_2O_3 and the temperature for the leaching is 105°–110° C.; separating the SiO_2 containing residue from the $AlCl_3$ solution formed in the leaching; subjecting the SiO_2 containing residue to washing to separately recover the washed SiO_2; extracting the $AlCl_3$ solution with an extraction agent consisting of a higher paraffin hydrocarbon for removing iron therefrom, said extraction agent being used in a ratio with respect to the $AlCl_3$ containing solution of 1:1 to 1:5; subjecting the organic phase containing iron to extraction with water; subjecting the now iron free aluminum chloride solution to evaporation to form a solution containing about 30 wt % of $AlCl_3$; thereafter subjecting the thusly evaporated solution to crystallization and recovering the crystals thus formed; subjecting the recovered crystals to a two stage thermal decomposition, the first stage being carried out at 150°–200° C. and the second stage at 1200°–1300° C.; recovering the pure α alumina thereby formed.

4,224,288

ALUMINA PRODUCTION

Owen E. Potter, Camberwell, Australia, assignor to Monash University, Clayton, Australia

Filed Feb. 6, 1979, Ser. No. 10,082

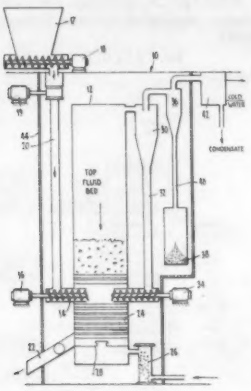
Claims priority, application Australia, Jan. 8, 1979, 43201/79

Int. Cl.[2] C01F *7/44*

U.S. Cl. 423—123 **5 Claims**

1. A process for the production of alumina which comprises

the steps of digesting bauxite by dissolving it in caustic liquors at 140° C. to 250° C. under pressure, and cooling and seeding the resulting solution to produce a precipitate of alumina trihydrate containing uncombined moisture, drying the alumina trihydrate to reduce the uncombined moisture content thereof, and feeding the dried alumina trihydrate to a calciner to convert the alumina trihydrate to alumina, characterized in that the alumina trihydrate is dried by feeding it to a fluidized bed apparatus in which the fluidized mass is alumina trihydrate and in which the fluidized mass is heated indirectly by means of steam from the digestion and caustic recovery system, said steam used for indirect heating being saturated stem having a temperature in the range from 125° C. to 250° C.



4,224,289

ALKALI REGENERATION PROCESS

Geoffrey H. Covey, Eltham North, and William H. Algar, Donvale, both of Australia, assignors to Australian Paper Manufacturers Limited, South Melbourne, Australia

Filed Apr. 18, 1979, Ser. No. 31,215

Claims priority, application Australia, Apr. 20, 1978, PD4129; Nov. 16, 1978, PD6798

Int. Cl.[3] **C01D** *1/04;* **D21C** *11/04*

U.S. Cl. 423—155 **5 Claims**

1. A method of recovering an alkali or alkaline earth metal oxide or hydroxide from a solution containing an alkali or alkaline earth metal carbonate, organic chemicals and impurities which comprises burning said solution in a fluidized bed of particles of an oxide of a transition metal selected from Ti, Fe, Co, Ni and Mn, and maintaining said fluidized bed at a temperature at which said alkali or alkaline earth metal carbonate becomes molten, subsequently recovering a mixed oxide compound from said fluidized bed, submerging said mixed oxide in hot water at a temperature not lower than about 70° C. to form an alkali or alkaline earth metal oxide or hydroxide and a precipitate of the transition metal oxide, subsequently separating said precipitate for recycling to said fluidized bed and recovering a solution of said alkali or alkaline earth metal oxide or hydroxide.

4,224,290

PROCESS FOR RECYCLING CHEMICAL PLANT WASTE STREAMS CONTAINING RECOVERABLE CHLORINE

Richard W. Lynch, Chattanooga, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed Sep. 28, 1978, Ser. No. 946,692

Int. Cl.[2] **C01D** *3/08*

U.S. Cl. 423—158 **38 Claims**

1. A process for recovering organic hypohalite and alkali metal halide from an impure aqueous solution containing alkaline earth metal halide and alkaline earth metal hypohalite which comprises:

(a) reacting said impure aqueous solution with alkali metal hypohalite to form an aqueous salt solution, wherein the molar ratio of said alkali metal hypohalite to said alkaline earth metal halide is in the range from about 2:1 to about 10:1;

(b) admixing said aqueous salt solution with an organic alcohol to form an organic-aqueous salt solution;

(c) reacting a gas containing chemically bound oxygen with said organic-aqueous salt solution to form a slurry of solid particles suspended in a liquid mixture of an organic phase and an aqueous phase;

(d) separating said solid particles from said liquid mixture;

(e) separating said liquid mixture into an aqueous phase and an organic phase;

(f) said aqueous phase predominating in alkali metal halide; and

(g) said organic phase predominating in organic hypohalite.

4,224,291

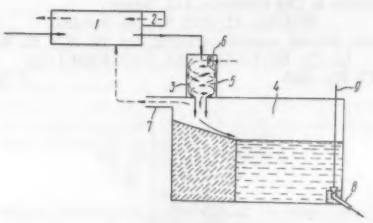
METHOD OF DEHYDRATING CARNALLITE

Jury A. Korotkov, ulitsa Pyatiletki, 102, kv. 38; Eduard F. Mikhailov, ulitsa Parizhskoi Kommuny, 9, kv. 49; German A. Andreev, prospekt Lenina, 43, kv. 13; Boris I. Eltsov, ulitsa Marata, 80, kv. 38; Jury A. Polyakov, prospekt Lenina, 66, kv 38; Boris G. Shestakov, ulitsa Jubileinaya, 54, kv. 62, all of, Berezniki Permskoi oblasti, and Galina D. Kechina, ulitsa Buachidze, 229, kv. 34, Ordzhonikidze Severo-Osetinskoi ASSR, all of U.S.S.R.

Filed Apr. 10, 1978, Ser. No. 895,277

Int. Cl.[2] **C01F** *5/30*

U.S. Cl. 423—178 **3 Claims**



1. In a method of dehydrating carnallite comprising heating preliminarily enriched carnallite, in a solid state with a water content of 39–41 wt.%, up to 205°–230° C., by fuel combustion products having a temperature of 500°–600° C., to produce a partially dehydrated carnallite in a solid state having a water content of 3–8 wt.%, further dehydrating said partially dehydrated carnallite with a drying gas by feeding it into a reaction zone defined by a rotation surface; said drying gas comprising a fuel combustion product introduced into said reaction zone tangentially to the rotation surface at a temperature sufficient to melt the carnallite, and at a rate which ensures the formation of an intensive gaseous eddy flow occupying the entire volume of the reaction zone; the improvement which comprises: contacting the gaseous fuel combustion product, containing water vapor, with gaseous chlorine at a temperature at 1050° to 1150° C., to form HCl, whereby the melted carnallite is thrown against the side surface of the reaction zone, thereby forming a continuous film, and recovering said carnallite melt having a water content of no more than 0.5 wt.%.

4,224,292

CATALYTIC REDUCTION OF NITROGEN OXIDES

Mitsuo Uchida; Takeshi Okano, both of Machida; Kunichi Matsushita, Yokohama; Yasuo Oguri, Tokyo; Junji Saito, Machida, and Takao Kaneko, Yokohama, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Continuation of Ser. No. 844,438, Oct. 21, 1977, abandoned. This application Dec. 5, 1978, Ser. No. 966,660

Claims priority, application Japan, Nov. 1, 1976, 51/131490; Nov. 17, 1976, 51/137977; Nov. 17, 1976, 51/137978; Dec. 1, 1976, 51/144118

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—239 10 Claims

1. A method of catalytically reducing nitrogen oxides which comprises contacting a combustion gas containing nitrogen oxides at a temperature of 200° to 600° C. in the presence of oxygen and ammonia with a catalyst comprising at least a catalytic component selected from compounds of copper and iron supported on a carrier comprising hydrated calcium silicate.

4,224,293

REMOVAL OF LOW CONCENTRATIONS OF HYDROGEN FROM CHLORINE GAS

Wim J. M. Pieters, Morristown, and Franz Wenger, Mountainside, both of N.J., assignors to Allied Chemical Corporation, Morris Township, Morris County, N.J.

Filed Feb. 14, 1979, Ser. No. 12,086

Int. Cl.[2] B01D *53/34*

U.S. Cl. 423—248 11 Claims

1. The method of reducing hydrogen contamination of chlorine-containing gas contaminated with less than about 6 percent by volume of hydrogen, which comprises contacting said gas at temperature within the range of from about 100° to about 400° C. with a catalyst selected from the group consisting of copper chloride and palladium.

4,224,294

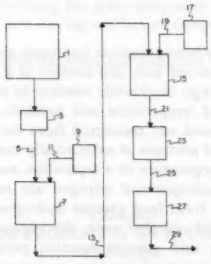
PREPARATION OF SODIUM ORTHOPHOSPHATE MIXTURES

Edward J. Powers, Harrison, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Jan. 15, 1979, Ser. No. 3,323

Int. Cl.[2] C01B *25/30*

U.S. Cl. 423—309 12 Claims



1. A process for preparing a mixture containing disodium hydrogen phosphate and monosodium dihydrogen phosphate in about a 2:1 mole ratio by the reaction of soda ash with phosphoric acid, wherein the improvement comprises the steps of sequentially:

(A) Milling monohydrate process soda ash to a particle size distribution such that at least 70 weight percent passes 100 mesh and at least 50 weight percent passes 200 mesh (U.S. Standard Screen Series)

(B) Reacting in a semi-solid reaction medium the solid milled soda ash of step (A) with concentrated phosphoric acid in such proportion that the soda ash reactant provides between about 74% to about 94% of the stoichiometric sodium carbonate requirements of the reaction represented by the equation:

$$5Na_2CO_3+6H_3PO_4 \rightarrow 2NaH_2PO_4+4Na_2HPO_4+-5CO_2+5H_2O$$

(C) Uniformly mixing caustic soda with the reaction product of step (B) to yield a product having a sodium to phosphorus mole ratio of about 1.67 to 1.

4,224,295

PROCESS FOR THE PRODUCTION OF FINELY DIVIDED SILICIC ACID BY SPRAY DRYING

Bernd Brandt, Wesseling-Berzdorf; Peter Nauroth, Wesseling; Albert Peters, Erftstadt-Liblar, and Helmut Reinhardt, Rodenkirchen, all of Fed. Rep. of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 655,328, Feb. 5, 1976, abandoned. This application Jun. 15, 1978, Ser. No. 916,020

Claims priority, application Fed. Rep. of Germany, Feb. 7, 1975, 2505191

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.[2] C01B *33/12, 33/18*

U.S. Cl. 423—335 33 Claims

1. A process for preparing a finely divided silicic acid having little grit, comprising:

(a) preparing a sprayable aqueous suspension of a precipitated silicic acid containing at least about 12% by weight solids by:

(1) continuously feeding a silicic acid filter cake and a suspension agent into a dissolver container provided with stirring means;

(2) stirring said filter cake and suspension agent while maintaining a maximum pH value of about 4 in the suspension, said stirring means having a peripheral speed of about 20–30 m/sec; and

(3) continuously removing a portion of the resulting suspension from a zone of highest turbulence of the suspension in said container; wherein said container and said stirring means each have a diameter and the ratio of container diameter to the diameter of the stirring means is about 3:1 and the ratio of container diameter to level of filling of said container is maintained at a maximum of about 1:2; and further wherein the silicic acid suspension in said container is maintained in an amount of at least 1.5 to about 2 kg for each 1 kg of silicic acid filter cake which is added to the container; and thereafter

(b) spray drying said resulting suspension in the presence of a base or basic-reacting substance selected from the group consisting of alkali metal hydroxides, alkaline earth metal hydroxides, alkali metal carbonates or bicarbonates, alkaline earth metal carbonates or bicarbonates, ammonia or a compound capable of liberating ammonia in an amount at least sufficient to yield a dried, finely divided silicic acid having a pH value of >6 in a 5% by weight aqueous suspension.

4,224,296

SUPER HARD-HIGHLY PURE SILICON NITRIDES, AND A PROCESS AND APPARATUS FOR PRODUCING THE SAME

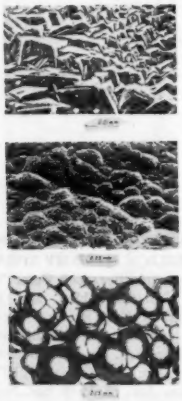
Toshio Hirai, and Koichi Niihara, both of Sendai, Japan, assignors to The Research Institute for Iron, Steel and Other Metals of the Tohoku University, Sendai, Japan

Division of Ser. No. 756,282, Jan. 3, 1977, Pat. No. 4,118,539. This application Jul. 21, 1978, Ser. No. 926,611

Claims priority, application Japan, Jan. 13, 1976, 51-2468

Int. Cl.[2] C10B *21/06*

U.S. Cl. 423—344 **1 Claim**



1. A super hard-highly pure silicon nitride having an amorphous structure and a micro Vickers hardness of more than 2,200 kg/mm^2 under a load of 100 g.

4,224,297

METHOD FOR REACTIVATING A RESIDUE CONTAINING ELEMENTAL SILICON

Herbert Straussberger; Willi Streckel, and Rudolf Riedle, all of Burghausen, Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed May 17, 1978, Ser. No. 906,714

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1977, 2733290; Feb. 24, 1978, 2807951

Int. Cl.[2] C01B *33/02;* B01J *37/00*

U.S. Cl. 423—348 **4 Claims**

1. A method for reactivating a residue containing particles of elemental silicon having a maximum diameter of 50 microns which has been recovered from the reaction of a halogen containing compound selected from the group consisting of hydrocarbon halides, hydrogen halides and mixtures thereof with a solid porous contact mass containing silicon to form silicon halides, which comprises heating the residue containing elemental silicon to a temperature of from 100° to 350° C. for from 20 to 80 hours in the presence of a gaseous medium selected from atmospheric air, nitrogen and mixtures thereof.

4,224,298

REFORMING OF HYDROCARBONS

Lee F. Robinson, 3 Athenaeum Hall, Vale-of-Health, London NW3 1AP, England

Filed Apr. 11, 1978, Ser. No. 895,454

Claims priority, application United Kingdom, Apr. 14, 1977, 15771/77

Int. Cl.[2] C01C *1/04;* C07C *1/02*

U.S. Cl. 423—359 **10 Claims**

1. A process for reforming hydrocarbons in a reformer which includes

a furnace containing a fluidized bed of particulate material, and

reformer tubes at least partly located in said fluidized bed and the interiors of which are isolated from fluid flow communication with said fluidized bed, said process comprising:

supplying hydrocarbon-containing feedstock to the upstream ends of the tubes,

reforming said feedstock in the tubes at a pressure in excess of 50 atmospheres absolute,

maintaining the fluidized bed at a pressure which does not differ significantly from that in the tubes, and

conducting reformate product in said tubes directly out of said tubes and without entry into said fluidized bed.

4,224,299

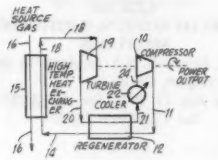
COMBINATION CHEMICAL PLANT AND BRAYTON-CYCLE POWER PLANT

Everett M. Barber, Wappingers Falls; James R. Muenger, Beacon, and David L. Alexander, Fishkill, all of N.Y., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 765,475, Feb. 4, 1977, abandoned. This application Nov. 2, 1978, Ser. No. 956,958

Int. Cl.[2] C01C *1/04*

U.S. Cl. 423—360 **3 Claims**



1. In a process wherein gaseous hydrogen and nitrogen are supplied to and reacted with one another in a reaction zone, wherein they undergo exothermic reaction to produce ammonia at an elevated temperature and pressure, the resulting ammonia is separated and recovered from unconverted gaseous hydrogen and nitrogen at substantially reaction pressure and at reduced temperature in a separation zone and unconverted gaseous hydrogen and nitrogen are recycled to the reaction zone and fresh feed gaseous hydrogen and nitrogen are supplied to said reaction zone, the improvement which comprises passing said gaseous reaction product ammonia admixed with unconverted gaseous reactants directly from said reaction zone at said elevated temperature and pressure into indirect heat exchange with relatively cooler unconverted gaseous reactants from said separation zone in a first heat exchange zone, thereby heating said unconverted gaseous reactants, further heating resulting unconverted gaseous reactants to a temperature higher than said reaction zone temperature by indirect heat exchange with a heating medium in a second heat exchange zone, thereafter expanding resulting heated unconverted reactants in a heat engine with the production of power therefrom, cooling and recompressing said reactants and supplying said recompressed unconverted reactants to said reaction zone.

4,224,300

PROCESS FOR PREPARATION OF CARBONYL SULFIDE

Nobuo Takahashi, Shizuoka; Masanobu Uchiyama, Fuji; Takaaki Futami, Shimada, and Yoji Imamiya, Shizuoka, all of Japan, assignors to Ihara Chemical Industry Co., Ltd., Tokyo, Japan

Filed Aug. 22, 1979, Ser. No. 68,743
Int. Cl.[2] C01B *31/26*
U.S. Cl. 423—416 7 Claims

1. A process for preparing carbonyl sulfide by the vapor phase reaction of carbon monoxide with sulfur wherein a gaseous mixture of sulfur with carbon monoxide is maintained at an elevated temperature, characterized by effecting said vapor phase reaction in a reactor, in which at least the inner surface is made of an alloy consisting essentially of, based on the weight of the alloy, from 20 to 60% of chromium, from 40 to 65% of nickel, from 0 to 10% of molybdenum, from 0 to 4% of niobium plus tantalum, and from 0 to 3% of iron.

4,224,301

REMOVAL OF TELLURIUM FROM GLYCOL ESTER SOLUTIONS

Thomas A. Washall, Wilmington, Del., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 20, 1979, Ser. No. 67,658
Int. Cl.[2] C01B *19/00*
U.S. Cl. 423—508 9 Claims

1. A process for the removal and recovery of tellurium from tellurium-containing vicinal glycol ester solutions derived from the tellurium catalyzed liquid phase reaction of an olefin, molecular oxygen and an aliphatic monocarboxylic acid in the presence of a halide ion which comprises the steps of:

contacting the tellurium-containing vicinal glycol ester solution at a suitable temperature with granular activated carbon to adsorb soluble tellurium compounds from said tellurium-containing ester solution;

subjecting the activated carbon containing a tellurium compound adsorbate to an acid wash followed by a steam purge to desorb the tellurium compounds from the carbon and form a tellurium containing wash solution;

stripping or distilling the wash solution to remove contained water and acid leaving a tellurium compound concentrate; and

recovering tellurium from said tellurium concentrate.

4,224,302

PROCESS FOR PRODUCING AN ALUMINA CATALYST CARRIER

Kunio Okamoto, Aichi; Junichiro Naito, Toyokawa, and Mitsuru Asano, Okazaki, all of Japan, assignors to Nippon Soken Inc., Tokyo, Japan

Continuation of Ser. No. 721,591, Sep. 8, 1976, abandoned. This application Mar. 5, 1979, Ser. No. 17,279
Claims priority, application Japan, Sep. 16, 1975, 50-111972; Mar. 3, 1976, 51-22847
Int. Cl.[3] C01F *7/02, 7/44*
U.S. Cl. 423—628 5 Claims

1. A method for preparing boehmite from powdered aluminum hydroxide ($Al_2O_3.3H_2O$) comprising the steps of:

providing a first aluminum hydroxide having a particle diameter of about 40μ;

mixing said first aluminum hydroxide with an equal amount of a second aluminum hydroxide having a particle diameter of about 3μ;

admixing the resulting mixture with an aqueous solution of methylcellulose;

forming the resulting mixture of the first and second aluminum hydroxide and the aqueous solution of methylcellulose into agglomerates having a diameter of 3 to 4 mm; and

contacting the agglomerates with water vapor at a temperature of at least about 170° C. and a pressure of at least about 6 kg/cm^2 to transform the aluminum hydroxide into boehmite ($Al_2O_3.H_2O$).

4,224,303

SIGNALLING PARTICLES FOR INTRODUCTION INTO BLOOD FLOWING THROUGH A VESSEL OF INTEREST

Robert F. Shaw, Portola Valley, Calif., assignor to A. C. Smith

Division of Ser. No. 487,425, Jul. 10, 1974, Pat. No. 4,111,191, which is a continuation of Ser. No. 249,161, May 1, 1972, abandoned. This application Jul. 21, 1978, Ser. No. 926,841
Int. Cl.[2] A61K *29/00, 43/00*
U.S. Cl. 424—1 6 Claims

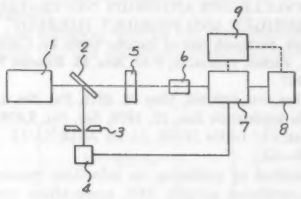
1. Particles for introduction into the blood of a subject to interact with apparatus that can detect signals outside the body of the subject, the particles having a dimension not greater than approximately 8 microns for passing through capillary beds of the body of the subject.

4,224,304

METHOD AND APPARATUS FOR THE MEASUREMENT OF ANTIGENS AND ANTIBODIES

Masanobu Sawai, Yamato; Tadamitsu Sudo, Sagamihara, and Shogo Enomoto, Tokorozawa, all of Japan, assignors to Mitsubishi Chemical Industries, Limited, Tokyo, Japan

Continuation-in-part of Ser. No. 825,160, Aug. 16, 1977, Pat. No. 4,118,192. This application Jun. 20, 1978, Ser. No. 917,251
Claims priority, application Japan, Feb. 14, 1978, 53/15017
The portion of the term of this patent subsequent to Oct. 3, 1995, has been disclaimed.
Int. Cl.[2] G01N *21/24, 33/16*
U.S. Cl. 424—12 34 Claims



1. An absorbance method of measuring antigens and antibodies comprising reacting an antigen or antibody or a mixture thereof in a liquid medium with the corresponding antibody, antigen or mixture thereof which has been supported on insoluble carrier particles having an average diameter of not greater than 1.6 microns to sensitize the carrier particles, and wherein said carrier particles are present in the reaction mixture at a concentration of 0.05 to 1% by weight, irradiating the reaction mixture with light having a wavelength or wavelengths in the

range of 0.6 to 2.4 microns to measure the transmitted light at 2 or more points of time as the reaction proceeds, and then evaluating an increase in absorbance or percent absorption of the reaction mixture for a given period of time.

4,224,305

PREPARATION OF FORSSMAN ANTIBODY NEUTRALIZING ANTIGEN AND PRODUCT THEREOF

Joseph Zichis, deceased, late of Rancho Santa Fe, Calif., and Lillian K. Zichis, executrix, P.O. Box 48, Rancho Santa Fe, Calif. 92067

Division of Ser. No. 689,308, May 24, 1976, Pat. No. 4,139,606. This application Jan. 22, 1979, Ser. No. 5,659

Int. Cl.[2] **G01N** *31/00, 33/16;* **A61K** *35/12*

U.S. Cl. 424—12 **3 Claims**

1. The method of preparing a Forssman antibody neutralizing antigen, FN, composition comprising storing comminuted guinea pig or horse kidney tissue in saline solution containing NaN_3 at from about 2° to 4° C. for about 24 hours, heating the resulting suspension to about 95° C. and maintaining it at that temperature for about one-half hour, separating the solids from the supernatant liquid and cooling the liquid to about 25° C., adjusting the pH of the cooled supernatant liquid to about pH 7 with acid or basic potassium phosphate, precipitating the FN antigen from the solution by the addition of zinc sulphate, separating the precipitated FN antigen from the supernatant solution and dispersing the antigen in a phosphate buffer solution.

2. The FN antigen composition prepared by the method of claim 1.

4,224,306

PREPARATION OF AN INFECTIOUS MONONUCLEOSIS ANTIBODY NEUTRALIZING ANTIGEN AND PRODUCT THEREOF

Joseph Zichis, deceased, late of Rancho Santa Fe, Calif., and by Lillian K. Zichis, executrix, P.O. Box 48, Rancho Santa Fe, Calif. 92067

Division of Ser. No. 689,308, May 24, 1976, Pat. No. 4,139,606. This application Jan. 22, 1979, Ser. No. 5,498

Int. Cl.[2] **G01N** *31/00, 33/16;* **A61K** *35/12*

U.S. Cl. 424—12 **3 Claims**

1. The method of preparing an infectious mononucleosis antibody neutralizing antigen, MN, composition comprising heating heavily lysed beef erythrocytes dispersed in water to about 95° C. and maintaining the same at that temperature for about one-half hour, separating the solids from the mixture resulting from the preceding step, adjusting the pH of the supernatant solution to about pH 7 with acid or basic potassium phosphate, adding zinc sulphate to the solution to precipitate the MN antigen, separating the precipitated MN antigen from the supernatant solution and dispersing the antigen in a phosphate buffer solution.

2. The MN antigen composition prepared by the method of claim 1.

4,224,307

MOUTHWASH AND METHODS

Geraldine H. Thiele, New Oxford, Pa., and Samuel L. Yankell, Moorestown, N.J., assignors to Oxford Hill, Ltd., New Oxford, Pa.

Continuation of Ser. No. 755,400, Dec. 29, 1976, Pat. No. 4,097,604 and a continuation-in-part of Ser. No. 890,239, Mar. 27, 1978 and a continuation of Ser. No. 642,114, Dec. 18, 1975, abandoned, and a continuation-in-part of Ser. No. 724,942, Sep. 20, 1976, abandoned and a continuation-in-part of Ser. No. 724,943, Sep. 20, 1976, abandoned and a continuation-in-part of Ser. No. 113,362, Feb. 8, 1971, Pat. No. 3,741,204, and a continuation-in-part of Ser. No. 123,830, Mar. 12, 1971, Pat. No. 3,767,812, and a continuation-in-part of Ser. No. 283,662, Aug. 25, 1972, Pat. No. 3,805,776, and a continuation-in-part of Ser. No. 283,663, Aug. 25, 1972, Pat. No. 3,828,772, and a continuation-in-part of Ser. No. 369,236, Jun. 12, 1973, Pat. No. 3,924,000, and a continuation-in-part of Ser. No. 483,010, Jun. 25, 1974, Pat. No. 3,982,017; said Ser. No. 890,239, is a continuation of Ser. Nos. 724,943 and 483,010 and a continuation-in-part of Ser. Nos. 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 755,400, is continuation of Ser. No. 642,114, and a continuation-in-part of Ser. Nos. 483,010, 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 724,943, is a continuation of Ser. No. 483,010, and a continuation-in-part of Ser. Nos. 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 724,942 is a continuation-in-part of Ser. Nos. 483,010, 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 642,112, is a continuation-in-part of Ser. Nos. 483,010, 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 483,010, is a continuation-in-part of Ser. Nos. 369,236, 283,663, 283,662, 123,830, and 113,362; said Ser. No. 369,236 is a continuation-in-part of Ser Nos. 283,663, 283,662, 123,830 and 113,362; said Ser. No. 283,663, is a continuation-in-part of Ser. Nos. 283,662, 123,830 and 113,362; said Ser. No. 283,662 is a continuation-in-part of Ser. Nos. 123,830 and 113,362; said Ser. No. 123,830 is a continuation-in-part of Ser. No. 113,362.

The portion of the term of this patent subsequent to Jun. 27, 1995, has been disclaimed.

Int. Cl.[2] **A61K** *7/16, 31/20*

U.S. Cl. 424—49 **9 Claims**

1. The mouthwash composition which is a liquefied composition comprised of an effective amount of a non-necrotic fatty acid compound prepared from an unsubstituted, unsaturated fatty acid having at least one double bond, water, an effective amount of a buffering agent, 1 to 10 percent of ethanol, and an effective amount of at least one oil-soluble flavorant the pH of said liquefied composition being between 9 and 11.

4,224,308

ANTICALCULUS ORAL COMPOSITION

Abdul Gaffar, Somerset, and John J. Grecsek, Trenton, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

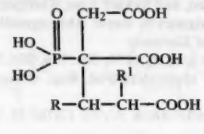
Filed Aug. 24, 1979, Ser. No. 69,463

Int. Cl.[2] **A61K** *7/16*

U.S. Cl. 424—49 **7 Claims**

1. An oral composition comprising an orally acceptable vehicle containing in an effective amount as an anticalculus

agent a 2-phosphono-butane-1,2,4-tricarboxylic acid compound of the formula



wherein R is hydrogen, lower alkyl or carboxyl, and R^1 is hydrogen or methyl, or an orally acceptable salt thereof.

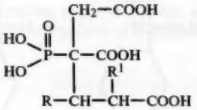
4,224,309

ANTIBACTERIAL ORAL COMPOSITION

Abdul Gaffar, Somerset, and John J. Grecsek, Trenton, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Aug. 24, 1979, Ser. No. 69,464
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 **16 Claims**

1. An oral composition comprising an oral vehicle, at least one nitrogen-containing antibacterial antiplaque agent, whose use has been observed to lead to staining or discoloration of dental surfaces, selected from the group consisting of cationic antibacterial antiplaque agent and long chain amine antibacterial antiplaque agent containing a fatty alkyl group of about 12 to 18 carbon atoms and as anti-staining additive, an effective stain-inhibiting amount of a 2,-phosphono-butane-1,2,4-tricarboxylic acid compound of the formula



(I)

wherein R is hydrogen, lower alkyl or carboxyl, and R^1 is hydrogen or methyl, or an orally acceptable salt thereof.

4,224,310

DENTIFRICE COMPOSITIONS

Nutan B. Shah, New Rochelle, N.Y., assignor to Richardson-Merrell, Inc., Wilton, Conn.

Filed Sep. 4, 1979, Ser. No. 72,173
Int. Cl.[2] A61K *7/22, 7/16*
U.S. Cl. 424—54 **2 Claims**

1. In a dentifrice formulation having incorporated therein strontium disodium ethylenediamine tetraacetate formed in situ the improvement comprising forming the strontium disodium ethylenediamine tetraacetate in situ by the reaction of disodium ethylenediamine tetraacetate with strontium carbonate in water and in the absence of any strontium chloride.

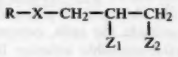
4,224,311

DISUBSTITUTED DERIVATIVES OF GLYCEROL AND COSMETIC COMPOSITIONS CONTAINING THE SAME AS AN OILY EXCIPIENT THEREFOR

Guy Vanlerberghe, Montjay-la-Tour, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

Filed Aug. 8, 1975, Ser. No. 602,961
Claims priority, application Luxembourg, Aug. 12, 1974, 70719
Int. Cl.[2] A61K *7/42, 7/021, 7/025, 7/32;* **C07C** *69/22*
U.S. Cl. 424—59 **25 Claims**

1. In a cosmetic composition containing an oily excipient the improvement comprising as the oily excipient an effective amount of at least one disubstituted derivative of glycerol having the formula



wherein one of Z_1 and Z_2 represents —YR′ and the other represents hydroxy, R and R′ represent a saturated and branched hydrocarbon residue of a R—OH or R′OH alcohol or a R—CO_2H or R′CO_2H acid, the said alcohol or acid containing from 6 to 20 carbon atoms, and X and Y, each independently represent oxygen or

linked to R or R′ through the free bond of the carbon atom of the carbonyloxy group.

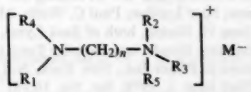
4,224,312

HAIR COMPOSITIONS CONTAINING CASTOR BASED QUATERNARIES

Murray C. Cooperman, East Windsor; Francis Duneczky, Westfield; Francis C. Naughton, Mountainside, and Robert W. White, Califon, all of N.J., assignors to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 812,098, Jul. 1, 1977. This application Oct. 23, 1978, Ser. No. 953,847
Int. Cl.[2] A61K *7/06, 7/08*
U.S. Cl. 424—70 **4 Claims**

1. In a hair shampoo, wherein the improvement comprises incorporating into said shampoo a compound having the formula:



wherein: R_1, R_2 and R_3 are independently selected from the group consisting of hydrogen, alkyl of about 1 to 10 carbon atoms and alkenyl of up to about 10 carbon atoms; n is an integer of about 1 to 10; R_4 is selected from the group consisting of 12-hydroxystearyl; ricinoleyl, 12-(2-hydroxyethyloxy) stearyl, 12-(2-hydroxyethyloxy) oleyl, 12-(2-hydroxypropyloxy) stearyl and 12-(2-hydroxy propyloxy) oleyl; R_5 is selected from the group consisting of benzyl and alkyl of about 1 to 3 carbon atoms; and M is selected from the group consisting of chloride, bromide, phosphate and sulfate.

4,224,313
PHYSIOLOGICAL PREPARATION CONTAINING LOADED CELLS IN SUSPENSION AND AN AGENT FOR COUNTERACTION OF CELL MEMBRANE DISINTEGRATION

Ulrich Zimmermann, Jülich; Günter Pilwat, Niederzier; Karin Bock, Aachen, and Hermann-Josef Buers, Jülich, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschrankter Haftung, Jülich, Fed. Rep. of Germany

Filed Dec. 9, 1977, Ser. No. 859,240

Claims priority, application Fed. Rep. of Germany, Dec. 9, 1976, 2655801

Int. Cl.[2] **A61K** *37/48, 43/00;* **C12B** *3/12;* **A61K** *35/14*

U.S. Cl. 424—94 **6 Claims**

2. A process for preparing a mass of loaded cells suspended in a solution, which cells by their loading are provided with material intended for chemical or physical interaction with substances present outside the cells, comprising the steps of suspending in a cell-compatible solution living animal cells selected from the group consisting of erythrocytes, lymphocytes, thrombocytes and leucocytes, and having cell membranes, increasing the permeability of the cell membranes by the effect of osmotic pressure, or by the effect of an electric field, or both, incorporating loading a medicament material into the cells by passage of said medicament material from a cell-compatible solution through the membranes of increased permeability, restoring the original permeability of the membranes by healing up the membranes by regeneration effect, then separating the cells from the solution in which they were suspended and putting them for preservation in suspension in a physiological solution of the same osmolarity as the loaded cell content, said process incorporating the improvement consisting in that:

in the step of incorporating material into the cells, a first material is incorporated which is of a kind which is compatible with the cell membranes and therefore produces no destruction of the cell membranes, which first material is selected from the group consisting of medicaments having a capability of reacting chemically or physically with substances in physiological solution outside the cell, and there is also incorporated into the loaded cells, at the time their cell membranes have an increased permeability, a second material added to the cell-compatible solution utilized in said step of incorporating material, said second material being selected from the group consisting of enzymes capable of decomposing proteins and enzymes capable of decomposing lipids, and having a gradual destructive effect on the cell membranes and being supplied with such dosing in said cell-compatible solution, that after the healing up of the cell membranes and the separation of the loaded cells from the solution containing materials to be incorporated in the cells, the cell membranes will be destroyed after a predetermined period of time.

4,224,314
ANTIBIOTICS PRODUCED BY SPECIES OF NOCARDIA

Walter D. Celmer, New London; Paul C. Watts, Mystic; Walter P. Cullen; Liang H. Huang, both of East Lyme, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Filed Mar. 2, 1979, Ser. No. 16,961

Int. Cl.[3] **A61K** *35/00*

U.S. Cl. 424—122 **3 Claims**

2. Antibiotic Compound 51,467 which is soluble in methanol, ethanol, chloroform and ethyl acetate; insoluble in heptane and water; has an ultraviolet light absorption maximum at 264 nm with $E_{1\ cm}^{1\%}$ value of 277; has the molecular formula of $C_{29}H_{39}O_{10}N$; has an optical rotation of $[\alpha]_D^{25} = +80.9°$ at a concentration of 1% in methanol; and when pelleted in KBr, exhibits characteristic absorption in the infrared region at the following wavelengths in microns: 2.90, 3.42, 5.75, 5.90, 6.40, 6.90, 7.05, 7.58, 8.50, 8.90, 9.70, 10.35, 11.60 and 13.25.

4,224,315
PSEUDOTRISACCHARIDES AND THEIR MEDICINAL USE

Peter Stadler, Haan; Karl G. Metzger, Wuppertal; Uwe Petersen, Leverkusen, and Eckart Voss, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

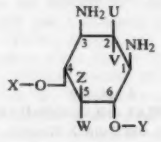
Filed Aug. 7, 1978, Ser. No. 931,708

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1977, 2737264

Int. Cl.[2] **A61K** *31/71;* **C07H** *15/22*

U.S. Cl. 424—180 **32 Claims**

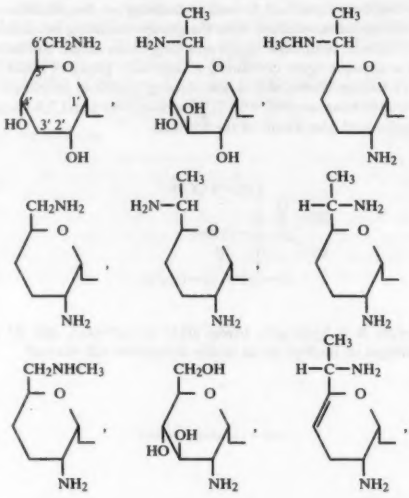
1. A pseudotrisaccharide compound of the formula (I) or a pharmaceutically usable salt thereof



(I)

in which

X represents a radical of the formula



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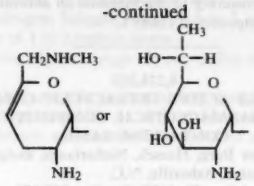
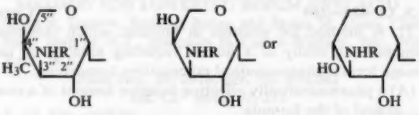


Y designates a radical of the formula



U and V are (a) both hydrogen or (b) one is hydrogen and the other is hydroxyl,

Z is hydrogen, hydroxyl or amino, and

W is hydrogen or hydroxyl with one of W and Z being hydrogen

R is alkyl having from 2 to 8 carbon atoms, alkenyl having from 2 to 6 carbon atoms, alkinyl having from 2 to 6 carbon atoms, cycloalkyl, cycloalkenyl having from 3 to 10 carbon atoms, cycloalkyl or cycloalkenyl-methyl or -ethyl, phenyl, naphthyl, phenylmethyl or phenylethyl, each of the hydrocarbon radicals being optionally substituted by from 1 to 3 substituents which are the same or different and each of which is hydroxyl, alkoxy having from 1 to 4 carbon atoms, alkylthio having from 1 to 4 carbon atoms, halogen, nitro, amino or monoalkylamino or dialkylamino having from 1 to 4 carbon atoms in the alkyl moiety in each case.

27. A method of combating disease caused by bacteria in warm-blooded animals which comprises administering to the said animals an antibacterially effective amount of an active compound according to claim **1** either alone or in admixture with a diluent or in the form of a medicament.

4,224,316

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Mar. 30, 1979, Ser. No. 25,535

Int. Cl.[2] **A61K** *37/00;* **C07C** *103/52;* **C08L** *37/00*

U.S. Cl. 424—177 **19 Claims**

1. A peptide having a formula

X-D-Phe-Z-E-Phe-J-L

and the pharmaceutically acceptable non-toxic acid addition salts thereof, wherein

X is selected from a group consisting of $—NH_2$, $—NHCH_3$, and $—N(CH_3)_2$;

Z is selected from a group consisting of Trp and Phe;

E is selected from a group consisting of D-Trp and D-Phe;

J is selected from a group consisting of Lys and Met; and

L is selected from a group consisting of $—CONH_2$, —CONHR, $—CONR_1R_2$, $—CH_2OR$, $—CH_2OH$, —COOH, and —COOR, wherein each R, R_1, and R_2 is independently selected from a group consisting of straight and branch alkyl groups containing 1–6 carbon atoms.

4,224,317

SUBSTITUTED 1-OXA-4-AZA-2,6-DISILACYCLOHEXANES AND USE THEREOF

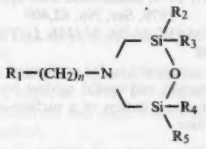
Sandor Barcza, Mt. Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation of Ser. No. 16,418, Mar. 1, 1979, abandoned. This application Aug. 27, 1979, Ser. No. 69,734

Int. Cl.[2] **C07F** *7/10;* **A61K** *31/695*

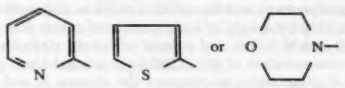
U.S. Cl. 424—184 **13 Claims**

1. A compound of the formula



wherein

R_1 represents



and

R_2, R_3, R_4 and R_5 each independently represent lower alkyl having 1 to 2 carbon atoms, and

n is 1 or 2,

or a pharmaceutically acceptable salt thereof.

13. A pharmaceutical composition for use as a muscle relaxant which comprises administering to a mammal in need of said treatment a muscle relaxant effective amount of a compound of claim **1** and a pharmaceutically acceptable carrier therefor.

4,224,318

3,5,6-TRIFLUORO-2-PYRIDINYL PHOSPHORUS COMPOUNDS

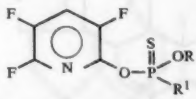
Chester E. Pawloski, Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Dec. 1, 1978, Ser. No. 965,543

Int. Cl.[2] **C07F** *9/58;* **A01N** *9/36*

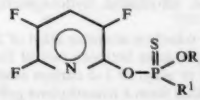
U.S. Cl. 424—200 **8 Claims**

1. A compound corresponding to the formula



wherein R represents alkyl of 1 to 4 carbon atoms and R^1 represents OR.

5. A composition useful for the kill and control of soil insects which comprises an insecticidally effective amount of a compound corresponding to the formula



wherein R represents alkyl of 1 to 4 carbon atoms and R^1

represents OR in admixture with a chemically inert adjuvant therefor.

4,224,319

ANTISEPTIC COMPOSITION FOR TOPICAL APPLICATION TO THE SKIN

Ernest Marcadet, 9 rue Lakanal, Paris, France

Continuation of Ser. No. 778,358, Mar. 17, 1977, abandoned, which is a continuation of Ser. No. 622,051, Nov. 14, 1975, abandoned, which is a continuation of Ser. No. 500,372, Aug. 26, 1974, abandoned, which is a continuation-in-part of Ser. No. 374,266, Jun. 27, 1973, abandoned. This application Jul. 31, 1979, Ser. No. 62,409

Int. Cl.[2] **A61K** *31/56, 31/355, 31/195, 31/07*

U.S. Cl. 424—238 **15 Claims**

1. An aqueous composition, for prolonged application to the skin without irritation and useful against bromidrosis, which comprises an aqueous solution of a surface-active amino-acid having the structure

$$R—NH\ (R^1NH)_n—R^2—COOH$$

where R is an aliphatic chain of 8 to 18 carbon atoms, R^1 and R^2, identical or different, are C_1 to C_3 alkylenes, while n is 0 to 1, the amount of the amino-acid being of 0.3% to 5% by weight of the composition, and the solution contains dispersed therein 1.5% to 15% by weight of a triglyceride of a fatty acid having 12 to 20 carbon atoms, and at least one of the vitamins A and E at a concentration of 40–12,000 International Units per 100 grams of composition as concerns the vitamin A and 1.0–40 International Units per 100 grams of composition as concerns vitamin E.

4,224,320

NOVEL STEROIDS OF THE PREGNANE SERIES, SUBSTITUTED IN THE 17-POSITION, THEIR MANUFACTURE AND THEIR USE

Helmut Dahl; Ernst Schöttle; Reinhold Wieske; Alfred Weber, and Mario Kennecke, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

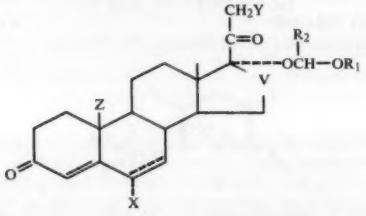
Filed Jan. 25, 1979, Ser. No. 6,692

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1978, 2803660

Int. Cl.[2] **A61K** *31/56;* **C07J** *9/00*

U.S. Cl. 424—243 **27 Claims**

1. A steroid of the formula



wherein

≈ represents a single or double bond,

X is hydrogen, fluorine or methyl;

Y is hydrogen, hydroxy or alkanoyloxy of 1–6 carbon atom;

Z is hydrogen or methyl;

V is methylene, ethylidene, hydroxymethylene or vinylidene; and

R_1 is alkyl of 1–6 carbon atoms or alkyl of 2–6 carbon atoms with an oxygen atom between two of the carbon atoms,

R_2 is hydrogen or alkyl of 1–6 carbon atoms, or

R_1 and R_2 together form a trimethylene group provided that Y is hydroxy or alkanoyloxy.

15. A method of treating inflammation in mammals which comprises administering to the mammal an anti-inflammatory amount of a compound of claim **1**.

4,224,321

BIOLOGICALLY ACTIVE TETRACYCLIC COMPOUNDS AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Willem J. van der Burg, Heesch, Netherlands, assignor to Akzona Incorporated, Asheville, N.C.

Filed Sep. 23, 1977, Ser. No. 835,972

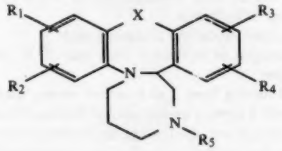
Claims priority, application Netherlands, Feb. 10, 1976, 7610942

Int. Cl.[3] **A61K** *31/55;* **C07D** *243/10*

U.S. Cl. 424—244 **27 Claims**

27. A method for sedation in humans, which comprises administering orally to a human requiring sedation in unit dosage form a pharmaceutical composition comprising:

(A) a pharmaceutically effective sedative amount of a compound of the formula:



or a pharmaceutically acceptable non-toxic salt thereof, wherein

R_1, R_2, R_3 and R_4 are each hydrogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_1-C_6 alkylthio, halogen, or trifluoromethyl;

R_5 is hydrogen or C_1-C_6 alkyl; and

X is methylene; and

(B) a pharmaceutically effective carrier.

4,224,322

3-AMINO-4-PHENYL-6-THIOMORPHOLINO-1H-PYRAZOLO-[3,4-b]PYRIDINES AND SALTS THEREOF

Josef Roch; Erich Müller; Berthold Narr; Josef Nickl, and Walter Haarmann, all of Biberach, Fed. Rep. of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Fed. Rep. of Germany

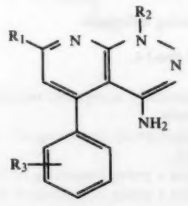
Continuation-in-part of Ser. No. 834,114, Sep. 19, 1977, Pat. No. 4,182,887. This application Sep. 13, 1979, Ser. No. 75,493

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1976, 2643753

Int. Cl.[3] **C07D** *471/04;* **A61K** *31/54*

U.S. Cl. 424—246 **6 Claims**

1. A compound of the formula



wherein

R_1 is unsubstituted, mono-substituted or di-substituted thiomorpholino, where the substitutents are selected from the group consisting of methyl, hydroxymethyl, hydroxyl, phenyl and benzyl;

R_2 is hydrogen, methyl or benzyl; and

R_3 is hydrogen, halogen, alkyl of 1 to 3 carbon atoms or alkoxy of 1 to 3 carbon atoms;

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

5. An antithrombotic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective antithrombotic amount of a compound of claim 1.

4,224,323

METHOD FOR LOWERING SERUM URIC ACID

William R. Darrow, Basking Ridge, and James M. Dunn, Cranbury, both of N.J., assignors to Carter-Wallace, Inc., New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,481
Int. Cl.[2] A61K *31/535*
U.S. Cl. 424—248.56 **1 Claim**

1. A method for lowering serum uric acid levels in humans which comprises administering a pharmaceutical composition to a human in need of such treatment, said composition comprising a pharmaceutical carrier and from about 25 to about 95% by weight of the total composition of 7-chloro-2-methyl-3,3a-dihydro-2H,9H-isoxazolo(3,2-b) (1,3)-benzoxazin-9-one.

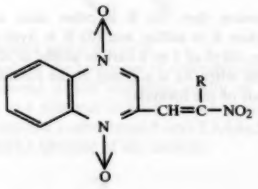
4,224,324

NITRO-OLEFIN-SUBSTITUTED QUINOXALINE DIOXIDES

Vernon V. Young, Terre Haute, Ind., assignor to International Minerals and Chemical Corporation, Terre Haute, Ind.

Filed May 21, 1979, Ser. No. 40,832
Int. Cl.[3] C07D *241/52;* A61K *31/495*
U.S. Cl. 424—250 **6 Claims**

1. A nitro-olefin-substituted quinoxaline dioxide represented by the formula



where R is hydrogen or methyl.

4. A method of controlling the growth of bacteria and fungi by applying to them or to the environment inhabited by them a compound of claim 1.

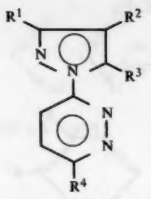
4,224,325

3-(1-PYRAZOLYL)-PYRIDAZINE DERIVATIVES AND HYPOTENSIVE COMPOSITIONS THEREOF

Géza Szilágyi; Endre Kasztreiner; Laszlo Tardos; Edit Kósa; László Jaszlits; György Cseh; Ilona Kovács, nee Szabó; Pál Tolnay; Sándor Elek; Istvan Elekes, and István Polgari, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyár Rt., Budapest, Hungary

Filed Jul. 11, 1978, Ser. No. 923,623
Claims priority, application Hungary, Oct. 25, 1977, GO 1381
Int. Cl.[3] C07D *403/04, 413/14;* A61K *31/50, 31/535*
U.S. Cl. 424—250 **12 Claims**

1. A compound of the formula I



wherein

R^1 is hydrogen, C_{1-6} alkyl, C_{2-4} hydroxyalkyl, C_{3-6} cycloalkyl or phenyl;

R^2 is hydrogen, fluorine, chlorine, bromine, C_{1-6} alkyl, C_{2-4} hydroxyalkyl, nitro, or $—NR^5R^6$, wherein R^5 and R^6 are the same or different and each is hydrogen, C_{1-4} alkyl or C_{2-4} hydroxyalkyl;

R^3 is hydrogen, C_{1-6} alkyl, C_{2-4} hydroxyalkyl, C_{3-6} cycloalkyl, phenyl, chlorine, hydroxyl, amino or methoxy;

R^4 is carbamoyl, cyano, $—NR^7—NHR^8$, or $—NR^9R^{10}$ and wherein: R^7 and R^8 are the same or different and each is hydrogen, C_{1-4} alkyl, C_{2-4} hydroxyalkyl, or C_{1-4} alkoxycarbonyl; and R^9 and R^{10} are the same or different and each is hydrogen, C_{1-5} alkyl, C_{2-4} hydroxyalkyl, C_{3-6} cycloalkyl, phenyl or benzyl; or $—NR^9R^{10}$ is a morpholine, piperidine or piperazine ring,

or a pharmaceutically acceptable acid-addition salt of the compound of formula I.

12. A pharmaceutical composition of hypotensive and prostaglandin catabolism inhibiting activity, containing as an active ingredient a compound of formula I as defined in claim 1, in association with a pharmaceutically acceptable and inert further ingredient.

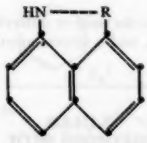
4,224,326

IMMUNOSUPPRESSIVE AGENTS

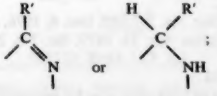
Ken Matsumoto, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 861,732, Dec. 19, 1977, abandoned. This application Sep. 21, 1978, Ser. No. 944,434
Int. Cl.[2] A61U *31/505*
U.S. Cl. 424—251 **15 Claims**

1. A method for suppressing mammalian immune response which comprises administering to a mammal in need of immune response suppression an effective amount of an active agent which is a compound of the formula



or a pharmaceutically-acceptable salt thereof, wherein R represents

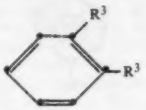


and R^1 represents

p-bromophenyl;

m-bromophenyl;

m- or p- R^2 phenyl wherein R^2 represents $—CF_3$, OCF_3, $—SCF_3$, or $—OC_2F_5$;
p-chlorophenyl;
p-isopropylphenyl; or
a radical of the formula



wherein each R^3 independently represents bromo or chloro.

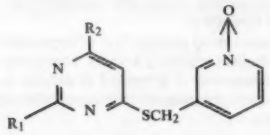
4,224,327

4-PYRIMIDYL SULFIDES FOR THE TREATMENT OF GASTRIC ULCERS

Giangiacomo Massaroli, Milan, Italy, assignor to Poli Industria Chimica S.p.A., Italy

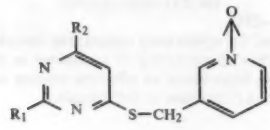
Filed Jan. 25, 1979, Ser. No. 6,504
Claims priority, application Italy, Feb. 2, 1978, 19905 A/78
Int. Cl.[2] **A61K** *31/505*; **C07D** *401/12*
U.S. Cl. 424—251 **9 Claims**

1. A compound of the formula



wherein R_1 and R_2 are the same or different, and are H, NH_2 or CH_3.

5. A pharmaceutical composition for treatment of pathological states related to gastric hypersecretion, comprising 4-pyrimidyl sulfides of the formula



wherein R_1 and R_2 are the same or different and are H, CH_3 or NH_2, as active agent, and a second agent, said second agent being inactive.

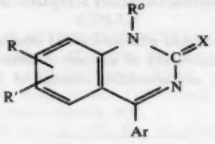
4,224,328

METHODS WITH 1-SUBSTITUTED-4-ARYL-QUINAZOLIN-2(1H)-ONES AND THIONES AND PYRIDO[2,3-D]PYRIMIDIN-2-ONES AS PLATELET AGGREGATION INHIBITORS

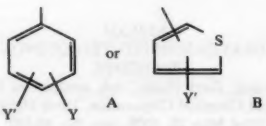
Edward I. Takesue, Easton, Conn., assignor to Sandoz, Inc., Hanover, N.J.

Continuation of Ser. No. 747,919, Dec. 6, 1976, abandoned. This application Apr. 11, 1979, Ser. No. 29,552
Int. Cl.[3] **A61K** *31/505*
U.S. Cl. 424—251 **24 Claims**

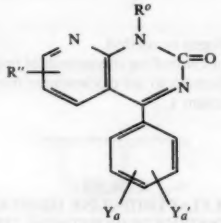
1. The method of inhibiting platelet aggregation in mammals comprising administering orally to a mammal in need of such treatment a platelet aggregation inhibiting effective amount of a compound selected from the group consisting of compounds of the formula:



wherein
R^O is alkyl of 1 to 6 carbon atoms, allyl, propargyl or cyclopropylmethyl,
R is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, fluoro, chloro, bromo, nitro, amino, alkylthio of 1 to 4 carbon atoms, trifluoromethyl, N-alkylamino of 1 to 4 carbon atoms or N,N-dialkylamino in which each alkyl is of 1 to 4 carbon atoms,
R′ is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, or
R and R′ together form 6,7-methylenedioxy,
X is oxygen or sulfur,
Ar is a group of the formula:



Y is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy or trifluoromethyl, and
Y′ is hydrogen, fluoro, chloro or alkyl of 1 to 4 carbon atoms,
with the provisos that: (1) R is other than amino or N-alkylamino when X is sulfur; and (2) R is hydrogen, fluoro, chloro, bromo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms when Ar is a group of the formula B;
and compounds of the formula:



wherein
R^O is as above defined,
each of Y_a and Y_a' is independently hydrogen, fluoro, chloro, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms, and
R″ is hydrogen or alkyl of 1 to 4 carbon atoms.

24. The method of claim **1**, **9**, **10** or **11** in which the compound is administered to a mammal in need of treatment prophylactically for thrombosis.

4,224,329

2-SUBSTITUTED-TRANS-5-ARYL-2,3,4,4a,5,9b-HEXAHYDRO-1H-PYRIDO[4,3-b]INDOLES

Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

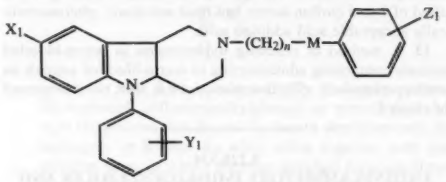
Continuation-in-part of Ser. No. 799,392, May 23, 1977, abandoned. This application Jan. 23, 1979, Ser. No. 5,698

Int. Cl.[2] A61K *31/445;* **C07D** *471/04*

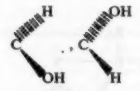
U.S. Cl. 424—256 **19 Claims**

1. A 2-Substituted-5-aryl-2,3,4,4a,5,9b-hexahydro-1H-pyrido[4,3-b]indole compound of the formula

(I)



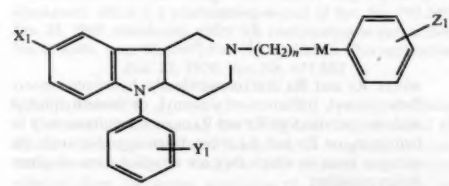
and the pharmaceutically acceptable acid addition salts thereof wherein the hydrogens attached to the carbon atoms in the 4a and 9b positions are in a trans-relationship to each other and the 5-aryl-2,3,4,4a,5,9b-hexahydro-1H-pyrido[4,3-b]indole moiety is dextrorotatory; X_1 and Y_1 are the same or different and are each hydrogen or fluoro; Z_1 is hydrogen, fluoro or methoxy; M is a member selected from the group consisting of



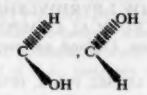
or mixtures thereof and n is 3 or 4.

12. A method for the treatment of schizophrenic manifestations in a mammal which comprises orally or parenterally administering to a mammal in need of such treatment a tranquilizing amount of a 2-substituted-5-aryl-2,3,4,4a,5,9b-hexahydro-1H-pyrido[4,3-b]indole of the formula

(I)



and the pharmaceutically acceptable acid addition salts thereof wherein the hydrogens attached to the carbon atoms in the 4a and 9b positions are in a trans-relationship to each other and the 5-aryl-2,3,4,4a,5,9b-hexahydro-1H-pyrido[4,3-b]indole moiety is dextrorotatory, X_1 and Y_1 are the same or different and are each hydrogen or fluoro; Z_1 is hydrogen, fluoro or methoxy; M is a member selected from the group consisting of



or mixtures thereof and n is 3 or 4.

4,224,330

ESTERS AND THIOLESTERS OF BENZOTHIENYL ACIDS

Clive A. Henrick; Jeffrey N. Labovitz, both of Palo Alto; Michael M. Leippe, Boulder Creek, and Sam L. Woo, Redwood City, all of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

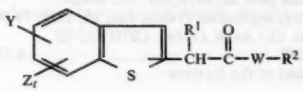
Filed Sep. 13, 1979, Ser. No. 74,850

Int. Cl.[3] A01N *43/40, 43/36, 43/10;* **C07D** *409/02*

U.S. Cl. 424—263 **28 Claims**

1. A compound of the following formula (A):

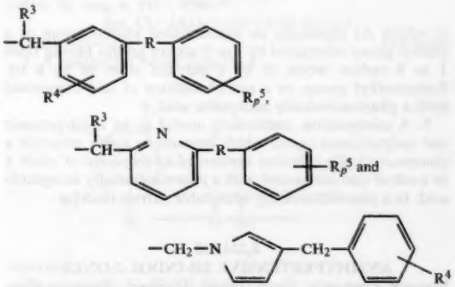
(A)



wherein,

W is oxygen or sulfur; t is zero, one, two, or three; each of Y and Z is, independently, selected from hydrogen, bromo, chloro, fluoro, lower alkyl, lower alkoxy, lower haloalkoxy and lower haloalkyl; R^1 is lower alkyl, lower alkenyl or lower cycloalkyl;

R^2 is selected from the groups,



R is oxygen, sulfur, methylene or carbonyl;

R^3 is hydrogen, cyano, ethynyl, methyl, ethyl, or trifluoromethyl;

R^4 is hydrogen or fluoro;

R^5 is hydrogen, bromo, chloro, fluoro, methyl, methoxy, or trifluoromethyl; and

p is zero, one or two.

4,224,331

DERIVATIVES OF 2-PYRIDYLTHIOUREA AND PHARMACEUTICAL COMPOSITIONS

Charles S. Fake, Harlow, England, assignor to Beecham Group Limited, England

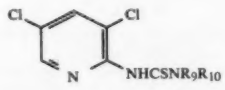
Division of Ser. No. 438,562, Feb. 1, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 570,015

Claims priority, application United Kingdom, Feb. 17, 1973, 7933/73

Int. Cl.[2] **A61K** *31/44*

U.S. Cl. 424—263 **3 Claims**

1. A method of treating gastric ulcers or reducing gastric acid secretion which comprises orally administering to a subject in need thereof a therapeutically effective amount of a composition which comprises a therapeutically effective amount of a compound of formula (III):



(III)

or a pharmaceutically acceptable acid addition sale thereof, wherein R_9 and R_{10} are each hydrogen, methyl or ethyl in combination with a pharmaceutically acceptable carrier.

4,224,332

1-AZA-[2,2,2]-BICYCLOOCTANES AND ANTI-DEPRESSANT AND ANTI-PARKINSONIAN COMPOSITIONS THEREOF

Claude G. A. Gueremy, Houilles; Francoise Hodac, Paris, and Christian L. A. Renault, Epinay sur Seine, all of France, assignors to Pharmindustrie, Gennevilliers, France

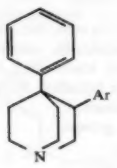
Filed Dec. 28, 1978, Ser. No. 973,847

Claims priority, application France, Jan. 10, 1978, 78 00490

Int. Cl.[2] **A61K** *31/445;* **C07D** *453/02*

U.S. Cl. 424—267 **6 Claims**

1. A compound of the formula:



(I)

in which Ar represents an unsubstituted phenyl group or a phenyl group substituted by 1 or 2 alkoxy groups having from 1 to 4 carbon atoms or by a halogen atom or by a trifluoromethyl group, or a salt of addition of said compound with a pharmaceutically acceptable acid.

5. A composition, particularly useful as an antidepressant and antiparkinson agent, which contains as active principle a pharmaceutically effective amount of a compound of claim **1** or a salt of said compound with a pharmaceutically acceptable acid, in a pharmaceutically acceptable carrier therefor.

4,224,333

ANTIHYPERTENSIVE 2H-INDOL-2-ONES

Francois Clemence, Paris; Daniel Humbert, Fontenay-sous-Bois, and Robert Fournex, Paris, all of France, assignors to Roussel Uclaf, Paris, France

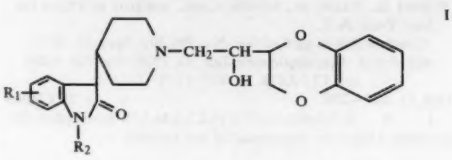
Filed Mar. 15, 1979, Ser. No. 21,243

Claims priority, application France, Mar. 22, 1978, 78 08292

Int. Cl.[2] **A61K** *31/445;* **C07D** *405/14*

U.S. Cl. 424—267 **18 Claims**

1. A compound selected from the group consisting of optically active isomers or racemates of 1,3-dihydro-3-{1-[2-(2,3-dihydro-1,4-benzodioxin-2-yl)-2-hydroxyethyl]-piperidin-4-yl}-2H-indol-2-ones of the formula



I

wherein R_1 is selected from the group consisting of hydrogen, chlorine, bromine, fluorine and alkoxy of 1 to 5 carbon atoms and R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and their non-toxic, pharmaceutically acceptable acid addition salts.

13. A method of relieving hypertension in warm-blooded animals comprising administering to warm-blooded animals an antihypertensively effective amount of at least one compound of claim **1**.

4,224,334

ANTIINFLAMMATORY IMIDAZOTHIAZOLES AND THIAZOLOPYRIMIDINES

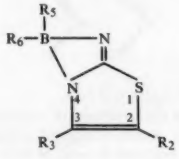
Robert E. Moser, Mentor; Larry J. Powers, Madison, and Zaven S. Ariyan, Mentor, all of Ohio, assignors to Diamond Shamrock Corporation, Dallas, Tex.

Continuation of Ser. No. 892,661, Apr. 3, 1978, abandoned, which is a division of Ser. No. 753,350, Dec. 22, 1976, Pat. No. 4,103,016, which is a continuation-in-part of Ser. No. 650,318, Jan. 19, 1976, Pat. No. 4,041,167. This application Apr. 2, 1979, Ser. No. 25,769

Int. Cl.[2] **A61K** *31/425;* **C07D** *277/00*

U.S. Cl. 424—270 **11 Claims**

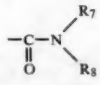
1. A compound of the formula



wherein

B is ethylene;

R_2 is C_1–C_3 alkylsulfonyl or a group of the formula



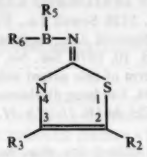
where R_7 and R_8 are independently hydrogen, monofluorophenyl, trifluoromethylphenyl, or trimethylphenyl with the proviso that R_7 and R_8 cannot simultaneously be hydrogen, or R_7 and R_8 when taken together with the nitrogen atom to which they are attached form cis-dimethylpyrrolidine;

R_3 is C_1–C_4 alkyl or phenyl;

R_5 and R_6 are independently hydrogen or C_1–C_4 alkyl;

on the pharmaceutically acceptable inorganic or organic acid addition or quaternary salts thereof.

8. A method of preventing and inhibiting the formation of granuloma tissue in an animal subject, which method comprises administering to an animal subject in need thereof a nontoxic antiinflammatory amount of at least one compound of the formula



wherein B is ethylene or vinylene; and

when B is ethylene, R_2 is C_1–C_3 alkylsulfonyl or a group of the formula

where R_7 and R_8 are independently hydrogen, monofluorophenyl, trifluoromethylphenyl, or trimethylphenyl with the proviso that R_7 and R_8 cannot simultaneously be hydrogen, or R_7 and R_8 when taken together with the nitrogen atom to which they are attached form cis-dimethylpyrrolidine; R_3 is C_1–C_4 alkyl or phenyl; R_5 and R_6 are independently hydrogen or C_1–C_4 alkyl; and

when B is vinylene, R_2 is hydrogen; R_3 is hydrogen or C_1–C_4 alkyl; R_5 and R_6 are independently hydrogen, phenyl, bromo- or nitrophenyl with the proviso that R_5 and R_6 cannot simultaneously be hydrogen;

or the pharmaceutically acceptable inorganic or organic acid addition or quaternary salts thereof.

4,224,335

TETRAHYDROCARBAZOLES AND THEIR USE

Aram Mooradian, Schodack, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Continuation-in-part of Ser. No. 465,238, Apr. 29, 1974, abandoned, which is a continuation-in-part of Ser. No. 425,205, Dec. 17, 1973, Pat. No. 3,959,309, which is a continuation-in-part of Ser. No. 172,206, Aug. 16, 1971, abandoned, which is a continuation-in-part of Ser. No. 793,545, Jan. 23, 1969, abandoned, which is a continuation-in-part of Ser. No. 659,606, Aug. 10, 1967, Pat. No. 3,642,816. This application Jan. 23, 1976, Ser. No. 651,882

Int. Cl.[2] A61K *31/40*

U.S. Cl. 424—274 **9 Claims**

1. A method for treating the failing heart in a mammal afflicted with congestive heart failure which comprises administering intravenously or orally to said mammal a compound selected from the group consisting of 3-(dimethylamino)-6-hydroxy-1,2,3,4-tetrahydrocarbazole, 3-(dimethylamino)-7-fluoro-6-hydroxy-1,2,3,4-tetrahydrocarbazole, 3-(dimethylamino)-5-hydroxy-9-methyl-1,2,3,4-tetrahydrocarbazole, 3-(dimethylamino)-7-hydroxy-9-methyl-1,2,3,4-tetrahydrocarbazole, 3-(1-pyrrolidyl)-7-hydroxy-1,2,3,4-tetrahydrocarbazole and 3-amino-7-hydroxy-1,2,3,4-tetrahydrocarbazole; and pharmaceutically acceptable acid-addition salts thereof; in an amount effective to provide a positive inotropic effect.

4,224,336

3-(2-AMINOETHYLTHIO)-6-AMIDO-7-OXO-1-AZABICYCLO[3.2.0]-HEPT-2-ENE-2-CARBOXYLIC ACID

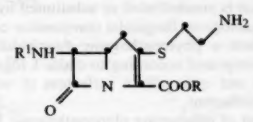
Burton G. Christensen, Metuchen; Ravindra N. Guthikonda, Edison; David B. R. Johnston, Warren, and Susan M. Schmitt, Scotch Plains, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 865,090, Dec. 28, 1977, abandoned. This application Apr. 17, 1979, Ser. No. 30,786

Int. Cl.[2] C07D *487/04*; A61K *31/40*

U.S. Cl. 424—274 **2 Claims**

1. A compound having the structural formula:



wherein

R is hydrogen, the pharmaceutically acceptable salts or cations or lower alkyl having 1–4 carbon atoms; lower alkenyl having 1–4 carbon atoms; benzyl, p-nitrobenzyl, pivaloyloxymethyl, 3-phthalidyl or phenacyl; and

R^1 is hydrogen, or phenylacetyl, phenoxyacetyl, 3-bromophenylacetyl, p-aminomethylphenylacetyl, 4-carboxymethylphenylacetyl, 4-carboxyamidomethylphenylacetyl, phenylthioacetyl, α-fluorophenylacetyl, D-phenylglycyl, 3-hydroxy-D-phenylglycyl, phenylmalonly, 3-chlorophenylmalonyl, α-phosphonophenylacetyl, α-sulfaminophenylacetyl, α-hydroxyphenylacetyl, α-tetrazolylphenylacetyl and α-sulfophenylacetyl.

2. An antibiotic pharmaceutical composition comprising a therapeutically effective amount of a compound according to claim 1 and a pharmaceutical carrier therefor.

4,224,337

PESTICIDAL COMPOSITIONS

Adolf Hubele, Magden, Switzerland; Wolfgang Eckhardt, Lörrach, Fed. Rep. of Germany, and Walter Kunz, Oberwil, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

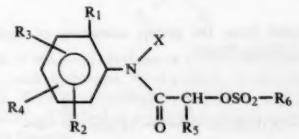
Division of Ser. No. 832,752, Sep., 1977, Pat. No. 4,143,155. This application Nov. 29, 1978, Ser. No. 964,541

Claims priority, application Switzerland, Sep. 17, 1976, 11816/76; Aug. 4, 1977, 9580/77

Int. Cl.[2] A01N *9/28*; C07D *307/32*

U.S. Cl. 424—279 **21 Claims**

1. A compound of the formula I



(I)

wherein

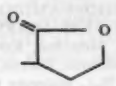
R_1 represents C_1–C_4 alkyl, C_1–C_4 alkoxy or halogen,

R_2 represents hydrogen, C_1–C_3 alkyl, C_1–C_4 alkoxy or halogen,

R_3 represents hydrogen, C_1–C_3 alkyl or halogen, and

R_4 represents hydrogen or methyl, with the proviso that the total number of carbon atoms contained by the substituents R_1, R_2, R_3 and R_4 does not exceed 8,

X represents



and

R_5 represents hydrogen or methyl and

R_6 represents C_1–C_6 alkyl which is unsubstituted or substituted by halogen or represents C_2–C_4 alkenyl or C_3–C_6 cycloalkyl or the group $—N(R_7)R_8$, in which R_7 represents hydrogen or C_1–C_4 alkyl and R_8 represents C_1–C_6 alkyl which is unsubstituted or substituted by halogen.

7. A phytopathogenic fungicidal composition containing as active ingredient a phytopathogenic fungicidally effective amount of a compound according to claim **1** together with a solid extender and optionally a surfactant or with a liquid diluent and a surfactant.

13. A method of combatting phytopathogenic fungi which comprises applying thereto or to the locus thereof a fungicidally effective amount of a compound according to claim **1**.

4,224,338

SIMULTANEOUS FUNGICIDAL AND MITICIDAL PROTECTION OF PLANTS EMPLOYING CERTAIN TIN COMPOUNDS

Ronald J. Sbragia, Clayton, Calif.; John L. Hardy, Fork Union, Va.; John E. Engelhart, Westfield; Melvin H. Gitlitz, Edison, both of N.J., and Robert J. Ehr, Pittsburg, Calif., assignors to The Dow Chemical Company, Midland, Mich. and M&T Chemicals Inc., Rahway, N.J.

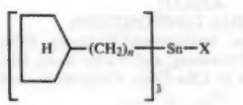
Filed Aug. 17, 1976, Ser. No. 715,072

Int. Cl.[2] A01N *9/00, 9/36;* **C07F** *7/22*

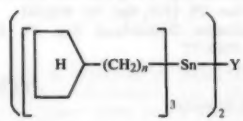
U.S. Cl. 424—288 **34 Claims**

1. A method of protecting plants from each of plant pathogenic fungal organisms and mites in the same treatment which comprises:

applying to the said plants to be protected an amount of at least one compound of the formula:

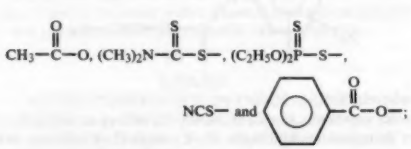


or



wherein

X is selected from the group consisting of hydroxyl, bromo, chloro, fluoro,



n is 0 or 1; and

Y is a chalcogen selected from O or S;

which amount is at least an effective antifungal amount and likewise at least an effective miticidal amount, but less than a substantially phytotoxic amount.

4,224,339

TREATMENT OF DISTURBED KERATINIZATION

Eugene J. Van Scott, 1138 Sewell La., Rydal, Pa. 19046, and Ruey J. Yu, 4 Lindenwold Ave., Ambler, Pa. 19002

Filed Oct. 10, 1978, Ser. No. 949,536

The portion of the term of this patent subsequent to Oct. 11, 1994, has been disclaimed.

Int. Cl.[2] A61K *31/315, 31/195*

U.S. Cl. 424—289 **12 Claims**

1. A method for treating dry skin, actinic or non-actinic keratoses, warts, and palmar and plantar keratoses skin conditions, said method comprising topically applying to the involved skin a symptom alleviating and therapeutically effective amount of a medicinal composition containing from about 0.1 to 30% by weight of at least one compound selected from the group consisting of cysteic acid, cysteine sulfinic acid and homocysteic acid and chelates of said compound with at least one metallic compound selected from the group consisting of ferric chloride, copper sulfate, copper carbonate, zinc sulfate, zinc oxide, zinc chloride, aluminum chlorohydrate, and aluminum zinc sulfate.

10. A method for treating dry skin, actinic and non-actinic keratoses, warts, palmar and plantar keratoses, said method comprising topically applying to the involved skin a symptom alleviating and therapeutically effective amount of a medicinal composition containing from about 0.1 to about 30% by weight of at least one compound selected from the group consisting of a reaction product of cysteic acid, cysteine sulfinic acid and homocysteic acid with a base selected from the group consisting of an organic primary, secondary, or tertiary alkylamine, alkanolamine, diamine, dialkylamine, dialkanolamine, alkylalkanolamine, trialkylamine, trialkanolamine, dialkylalkanolamine, or alkydialkanolamine wherein the alkyl or alkanol substituent has from 1 to 10 carbon atoms, an organic quaternary ammonium hydroxide compound, sodium hydroxide, and potassium hydroxide.

4,224,340

ANTI-INFLAMMATORY COMPOSITIONS CONTAINING α-PHENYL-N-PHENYLNITRONE COMPOUNDS

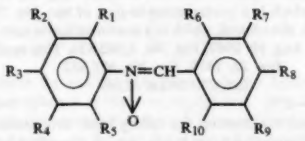
Henry F. Campbell, Lansdale; Norman F. Santora, Roslyn, and George H. Douglas, Malvern, all of Pa., assignors to William H. Rorer, Inc., Fort Washington, Pa.

Continuation of Ser. No. 839,961, Oct. 6, 1977, Pat. No. 4,153,722. This application Mar. 15, 1979, Ser. No. 20,849

Int. Cl.[2] A61K *31/135, 31/275*

U.S. Cl. 424—304 **4 Claims**

1. A composition in the form of a cream dermatological cleansing cake, powder or milk for the topical treatment of inflammation in warm-blooded animals by the topical administration of a pharmaceutically active compound of the formula:



(I)

where:

R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8, R_9, and R_{10} may be the same or different and are:

hydrogen,

alkyl,

cyano,

nitro,

amino,

halooweralkoxy,

halooweralkyl,

halo,
loweralkoxy, and,
hydroxy
and a suitable pharmaceutical carrier.

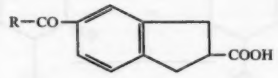
4,224,341

5-SUBSTITUTED INDAN-2 CARBOXYLIC ACID AND FUNCTIONAL DERIVATIVES

Michel Bayssat, Charbonnieres; Francis Sautel, Lyons; Jean-Claude Depin, Lyons, and Annie Betbeder Matibet, Lyons, all of France, assignors to Lipha, Lyonnaise Industrielle Pharmaceutique, Lyons, France

Continuation-in-part of Ser. No. 756,862, Jan. 4, 1977, abandoned. This application Dec. 14, 1977, Ser. No. 860,466
Claims priority, application France, Jan. 12, 1976, 76 00552; Dec. 14, 1976, 76 37754; Nov. 18, 1977, 77 33496
Int. Cl.[2] C07C *65/20, 69/95;* **A61K** *31/19, 31/215*
U.S. Cl. 424—308 **12 Claims**

1. A 5-substituted indan-2-carboxylic acid or functional derivative thereof having the formula



in which R is selected from the group consisting of cyclohexyl, phenyl, phenyl-alkenyl, phenyl-alkyl, and phenyl substituted by a substituent selected from the group consisting of halogen atoms, alkyl, alkoxy, acetamido, amino, dialkylamino, nitro, phenyl, alkylsulfonyl, dialkylaminosulfonyl and sulfamido groups, in the free form or a therapeutically acceptable salt or amide thereof, or a therapeutically acceptable ester selected from the group consisting of alkyl, dialkylaminoalkyl and cinnamoylamidoalkyl carboxylic acid esters.

9. The therapeutic composition for combatting inflammation and pain comprising an anti-inflammatory or analgesic amount of a compound in accordance with claim **1** and a pharmaceutically acceptable excipient therefor.

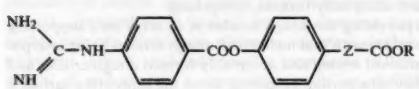
4,224,342

GUANIDINOBENZOIC ACID COMPOUNDS AND PROCESS FOR PREPARING THE SAME

Seisuro Fujii, Toyonaka; Tsuyoshi Watanabe, Kadoma; Masashi Shiota, Nishinomiya; Okumoto Itsuo, Ashiya, and Naohiro Kayama, Takatsuki, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

Filed Nov. 9, 1978, Ser. No. 959,276
Claims priority, application Japan, Nov. 9, 1977, 52-133379
Int. Cl.[2] A61K *31/155, 31/245;* **C07C** *129/12*
U.S. Cl. 424—310 **10 Claims**

1. A guanidinobenzoic acid compound represented by the formula (I)



[I]

wherein Z represents a methylene group, an ethylene group or a vinylene group; and R represents a hydrogen atom or a lower alkyl group, and the acid addition salts thereof.

9. A pharmaceutical composition having antiplasmin and anti-trypsin activity comprising a therpeautically effective amount of at least one guanidinobenzoic acid compound represented by the formula (I) and the acid addition salts thereof according to claim **1**, and one or more pharmaceutically acceptable carriers or diluents.

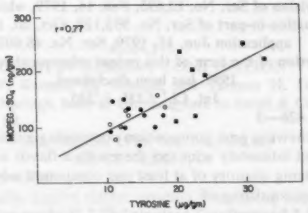
10. A method of inhibiting the activity of plasmin and/or trypsin comprising administering a therpeautically effective amount of at least one guanidinobenzoic acid compound represented by the formula (I) or the acid addition salts thereof according to claim **1** to a subject.

4,224,343

PROCESS AND COMPOSITION FOR DECREASING BLOOD SERUM PROLACTIN LEVELS

Richard J. Wurtman, Waban, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 898,740, Apr. 24, 1978. This application Apr. 5, 1979, Ser. No. 27,533
Int. Cl.[2] A61K *31/195*
U.S. Cl. 424—319 **4 Claims**



1. The process for reducing blood serum prolactin levels in a patient having a condition that results in undesirably high blood serum prolactin levels which comprises administering to said patient an amino acid composition containing between about 5 and 200 mg/kg body weight of tyrosine, phenylalanine or mixtures of tyrosine and phenylalanine.

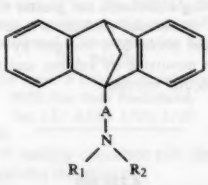
4,224,344

ORGANIC TRICYCLIC COMPOUNDS

Makoto Sunagawa; Hiromi Sato; Junki Katsube, all of Toyonaka, and Hisao Yamamoto, Kobe, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 11, 1975, Ser. No. 639,974
Claims priority, application Japan, Dec. 13, 1974, 49/143734; Dec. 27, 1974, 49/2909
Int. Cl.[2] C07C *87/28;* **A01N** *9/24*
U.S. Cl. 424—330 **10 Claims**

1. A compound of the formula:



wherein A is C_1–C_4 alkylene or C_3–C_4 alkenylene and R_1 and R_2 are each hydrogen, C_1–C_4 alkyl, C_3–C_4 alkenyl, C_3–C_4 alkynyl, C_3–C_6 cycloalkyl(C_1–C_3)alkyl, ar(C_1–C_3)alkyl or polyhalo(C_2–C_4)alkyl or a non-toxic pharmaceutically acceptable salt thereof.

4,224,345

CHEWING GUM BASE AND A COMBINATION OF A CHEWING GUM WITH FATTY MATTER

Shichigoro Tezuka, Kawasaki, and Masaki Shibata, Musashino, both of Japan, assignors to Lotte Co., Ltd, Tokyo, Japan

Filed Oct. 16, 1978, Ser. No. 951,719
Int. Cl.[2] A23G *3/30*
U.S. Cl. 426—3 **5 Claims**

1. A base composition for chewing gum comprising vinyl

acetate resin, ester gum, wax, emulsifier, calcium carbonate, talc and a fatty matter, and about 30 to 40% by weight of rubber.

4,224,346

CHEWING GUM COMPOSITION CONTAINING ONE OR MORE 2-OXABICYCLOOCTANE DERIVATIVES

Mark A. Sprecker, Sea Bright; Frederick L. Schmitt, Holmdel; Manfred H. Vock, Locust; Joaquin F. Vinals, Red Bank, all of N.J., and Jacob Kiwala, Brooklyn, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 12,695, Feb. 16, 1979, which is a continuation-in-part of Ser. No. 953,128, Oct. 20, 1978. This application Jun. 15, 1979, Ser. No. 48,803

The portion of the term of this patent subsequent to Mar. 25, 1997, has been disclaimed.

Int. Cl.[2] A23L *1/226*

U.S. Cl. 426—3 2 Claims

1. A chewing gum composition comprising a chewing gum blend and intimately admixed therewith a flavor augmenting or enhancing quantity of at least one compound selected from the group consisting of:

3-ethyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane and

3-isopropyl-1,5,8-trimethyl-2-oxabicyclo[2.2.2]octane

said compound being present in an amount of from 0.05 parts per million up to about 500 parts per million based on the total composition.

4,224,347

PROCESS AND PACKAGE FOR EXTENDING THE LIFE OF CUT VEGETABLES

Richard E. Woodruff, Salinas, Calif., assignor to TransFRESH Corporation, Salinas, Calif.

Continuation-in-part of Ser. No. 917,929, Jun. 22, 1978, abandoned. This application Jun. 8, 1979, Ser. No. 45,881

Int. Cl.[3] B65D *81/24;* B65B *25/04, 31/02*

U.S. Cl. 426—106 48 Claims

1. Process comprising placing at least one vegetable into a sealable package having permeabilities to oxygen, carbon monoxide and carbon dioxide at least as high as low density polyethylene having a thickness not greater than about 2 mils, and then sealing within said package a modified atmosphere comprising at least about 25% oxygen by volume, at least about 3% carbon monoxide by volume, and the balance substantially all molecular nitrogen.

4,224,348

PROCESS FOR IMPROVING THE PROPERTIES OF GELATIN

Kenji Hayashi, Ibaraki; Mitsuo Washizawa, Osaka, and Shuji Yokoo, Ibaraki, all of Japan, assignors to Kyowa Hakko Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 845,088, Oct. 25, 1977, abandoned. This application Apr. 2, 1979, Ser. No. 26,483

Claims priority, application Japan, Oct. 28, 1976, 51-129700

Int. Cl.[2] A23J *3/00;* A23L *1/04*

U.S. Cl. 426—234 17 Claims

1. A process for improving the cold water-solubility of gelatin, which comprises subjecting a gelatin having a water content of more than 8% by weight to microwave heating to remove at least 35% of said water content so as to obtain a treated gelatin having a water content of not more than 16% by weight.

4,224,349

MEAT TENDERIZING METHOD

Robert C. Gooch, 926 Washington Blvd., Abilene, Tex. 79601, and John J. Guenther, 1701 N. Jardot St., Stillwater, Okla. 74074

Continuation-in-part of Ser. No. 784,706, Apr. 5, 1977, abandoned. This application Nov. 17, 1978, Ser. No. 961,851

Int. Cl.[2] A23L *1/31*

U.S. Cl. 426—281 17 Claims

1. A post-mortem method for tenderizing meat from freshly slaughtered or chilled animals comprising injecting into the meat in an amount of about 2 to 10 percent based on the weight of the meat, an aqueous tenderizing composition consisting essentially of water and two or more salts selected from the group consisting of potassium chloride, sodium chloride, magnesium chloride and calcium chloride, the concentration of potassium chloride or sodium chloride being from about 0.3 molar to about 2.0 molar and the concentration of magnesium chloride or calcium chloride being from about 0.05 molar to about 0.8 molar.

4,224,350

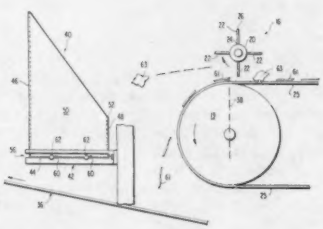
APPARATUS AND METHOD FOR SELECTIVELY EJECTING MALFORMED ARTICLES

Howard W. Merck, Doraville, Ga., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed Apr. 19, 1979, Ser. No. 31,375

Int. Cl.[3] A21C *5/00*

U.S. Cl. 426—473 12 Claims



1. A method for ejecting malformed dough articles from an array containing said dough articles as well as dough articles that are acceptably-formed, comprising:

(a) providing the dough articles in an array on a supporting surface with said malformed dough articles being interpositioned among said acceptably-formed dough articles and having a portion extending above the supporting surface a distance greater than the acceptably-formed dough articles;

(b) passing said array on said supporting surface along a first path; and

(c) moving an ejecting member in a second path relative to said first path at a substantial differential speed and thereby contacting said ejecting member with said portion of said malformed dough articles extending above said supporting surface a greater distance than said acceptably-formed dough articles, to eject said malformed dough articles from said surface while leaving the acceptably-formed dough articles on said supporting surface.

4,224,351

FLAVORING WITH CERTAIN SULPHUR COMPOUNDS

Erling Sundt, Pinchat-Geneva, and Gunther Ohloff, Bernex, both of Switzerland, assignors to Firmenich SA, Geneva, Switzerland

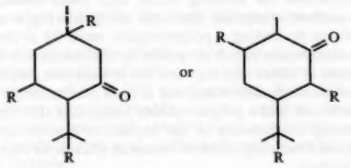
Continuation of Ser. No. 680,371, Apr. 26, 1976, abandoned, which is a continuation of Ser. No. 304,479, Nov. 7, 1972, abandoned, which is a division of Ser. No. 13,755, Feb. 24, 1970, abandoned. This application Apr. 27, 1978, Ser. No. 900,523

Claims priority, application Switzerland, Feb. 27, 1969, 2928/69; Nov. 3, 1969, 16374/69

Int. Cl.[3] A23L *1/226*

U.S. Cl. 426—535 8 Claims

1. A method for modifying, enhancing or improving the fruity and green organoleptic properties of flavouring compositions, which comprises incorporating in said materials from 0.001 to 10% by weight of a substantially pure compound of the formula



I or II

wherein one of the substituents R is —SH and the others are hydrogen.

4,224,352

PEAR FLAVORING CONTAINING A MIXTURE OF 2- AND 3-CYCLOTETRADECEN-1-ONES

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Manfred H. Vock, Locust; Domenick Luccarelli, Jr., Ocean; Frederick L. Schmitt, Holmdel; Gilbert Stork, Englewood, all of N.J.; Timothy MacDonald, Nashville, Tenn., and Arthur L. Liberman, Highlands, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 973,093, Dec. 26, 1978, Pat. No. 4,183,695. This application Jun. 27, 1979, Ser. No. 52,829

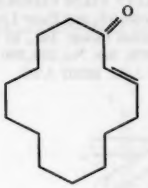
Int. Cl.[3] A23L *1/235*

U.S. Cl. 426—538 1 Claim

1. A pear flavor formulation comprising a mixture consisting essentially of vanillin, hexyl acetate, hexyl isobutyrate, trans-2-hexeral, n-hexanal, apple fusel oil, linalyl isobutyrate, hexyl-2-methyl butyrate, clary sage, coriander oil, ethyl alcohol and propylene glycol, and additionally containing 0.02% by weight of said mixture a composition made up of 65% by weight of the compound having the structure:

(Mixture of cis and trans isomers)

and 35% by weight of the compound having the structure:



(Trans isomer)

4,224,353

GELATIN DESSERT COMPOSITION

Theodore V. Kueper, La Grange, and Thomas H. Donnelly, Western Springs, both of Ill., assignors to Swift & Company, Chicago, Ill.

Filed Aug. 25, 1978, Ser. No. 936,839

Int. Cl.[3] A23L *1/04*

U.S. Cl. 426—576 7 Claims

1. A gelatin dessert starter product comprising two associated, but physically discrete, components, the first component being a syrup containing by weight, from 20–90% water, from 5–40% gelatin and from 5–40% edible acid selected from the group consisting of citric acid, malic acid, ascorbic acid, erythorbic acid, and mixtures thereof, wherein the acid is present at a level of from 30–200% basis the weight of gelatin, and said second component comprising a buffer salt in an amount sufficient to adjust final pH of the dessert to from 3.6 to 4.6.

4,224,354

METHOD FOR MAKING CHOCOLATE AND CHOCOLATE FLAVORED MATERIALS

Andrew Szegvari, Akron, Ohio, assignor to Union Process International, Inc., Akron, Ohio

Continuation of Ser. No. 751,913, Dec. 17, 1976, abandoned, which is a continuation-in-part of Ser. No. 468,270, May 10, 1974, Pat. No. 3,998,938, which is a continuation-in-part of Ser. No. 387,354, Aug. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 360,466, May 15, 1973, abandoned, which is a continuation-in-part of Ser. No. 166,421, Jul. 27, 1971, abandoned. This application Sep. 22, 1978, Ser. No. 944,740

The portion of the term of this patent subsequent to Dec. 21, 1993, has been disclaimed.

Int. Cl.[2] A23G *1/00, 1/10*

U.S. Cl. 426—584 48 Claims

1. A method of making chocolate and chocolate flavored compounds comprising the steps of:

A. providing a liquid continuum containing suspended chocolate solids to be ground in a pumpable mass;

B. providing a comminuting means in which a bed of comminuting elements in a confining vessel are agitated by a rotating shaft having protuberances extending therefrom;

C. repeatedly circulating the liquid continuum containing suspended chocolate solids sequentially through a pump means and the comminuting means at a streaming speed of at least 30 volumes of liquid continuum containing solids in the comminuting means per hour, said volume being the liquid dispersion capacity of the confining vessel;

D. comminuting said chocolate solids in the comminuting means as the liquid continuum containing chocolate solids steadily passes through the comminuting means; and

E. continuing steps C and D until the chocolate solids in the liquid continuum are reduced to desired particle size.

4,224,355

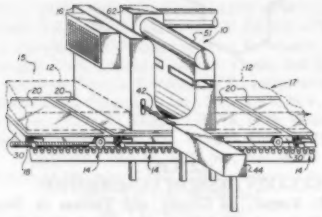
METHOD FOR QUALITY FILM FORMATION

Curtis M. Lampkin; Guy A. Roderick, and Peter Locke, all of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Filed Mar. 15, 1978, Ser. No. 886,890

Int. Cl.[2] F24J *3/02*; B05D *3/02*

U.S. Cl. 427—8 **11 Claims**



1. A method of forming films of material suitable for solar energy conversion devices and the like, comprising the steps of:

moving a glass substrate through a plurality of heat zones;

establishing at least one surface of said substrate within said heat zones at preselected temperatures;

spraying a portion of said at least one surface with a composition while said portion of said at least one surface is within at least one of said heat zones; and

selectively energizing heaters within each of said heat zones to obtain a thermal energy input distribution within each of said heat zones adjacent said substrate approximating thermal energy losses from said substrate to maintain said at least one surface within a range of temperatures effective to produce said film from said sprayed composition.

4,224,356

DEPOSITION OF METALS ON A BASE

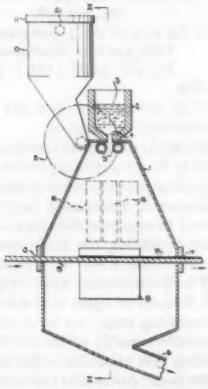
Alfred R. E. Singer, Swansea, Wales, assignor to The Secretary for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed May 30, 1978, Ser. No. 910,538

Claims priority, application United Kingdom, May 31, 1977, 22914/77; Nov. 26, 1977, 49306/77

Int. Cl.[2] B05D *3/06*

U.S. Cl. 427—34 **19 Claims**



1. A process for forming metallic articles which comprises generating a stream of atomized molten metal particles; directing said stream of atomized molten metal particles against a substrate to form a deposit of said metal thereon having a desired form; and simultaneously directing against said metal as it is deposited on said substrate, a stream of rounded solid particles so as to effect simultaneous peening of the deposited metal under conditions whereby the rounded solid particles are reflected from the deposited metal.

4,224,357

METHOD AND COMPOSITION FOR FORMING ELECTRON BEAM CURING HIGH BUILD COATING

Hiroshi Iwai; Hajime Sukejima, and Osamu Isozaki, all of Hiratsuka, Japan, assignors to Kansai Paint Co., Ltd., Japan

Filed Oct. 31, 1977, Ser. No. 846,797

Claims priority, application Japan, Mar. 14, 1977, 52/27860; Apr. 1, 1977, 52/37016

Int. Cl.[2] B05D *3/02*

U.S. Cl. 427—44 **14 Claims**

1. A method for forming cured high build coating film which method comprises the steps of: preparing a coating composition by mixing a polymerizable resin (I) as the main vehicle component which is curable by the irradiation of electron beams or ultraviolet rays and has at least two polymerizable unsaturated double bonds and at least one hydroxyl group in its molecule, and a polyisocyanate compound (II); applying said coating composition to the surface of a substrate to be coated; and irradiating electron beams or ultraviolet rays to the coated surface.

4,224,358

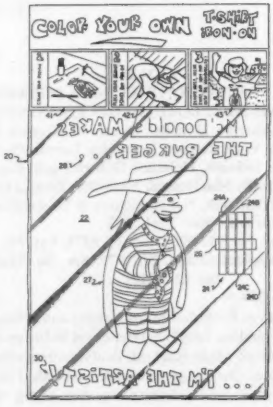
T-SHIRT COLORING KIT

Donald S. Hare, 4 Lexington Ave., New York, N.Y. 10010

Continuation-in-part of Ser. No. 933,027, Aug. 11, 1978, abandoned. This application Oct. 24, 1978, Ser. No. 954,228

Int. Cl.[3] B41M *3/12*

U.S. Cl. 427—147 **2 Claims**



1. A method of transferring a design from a transfer sheet to a fabric, comprising the steps of:

generating a design on the obverse surface of a transfer sheet by the application of energy thereto, while juxtaposing the rear surface of said transfer sheet with a layer of energy transferable material to provide a transferable mirror image of said design on the said rear surface, said transfer sheet including a pre-printed pattern and said design being generated by creating said design by hand to apply said energy to said obverse surface, said pre-printed pattern being used as a guide with respect to which said design is created;

placing said rear surface and said transferable mirror image of said design contiguous with a desired position on a surface of said fabric by visually aligning said design on said obverse surface with said desired position; and

applying energy throughout the extent of said design on the obverse surface of said transfer sheet to transfer said mirror image from said rear surface to said desired area on said fabric to thereby reproduce said design on said fabric.

4,224,359

POLYVINYL PYRIDINE MICROSPHERES

Alan Rembaum, Altadena; Amitava Gupta, Los Angeles, and Willi Volksen, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

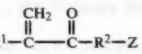
Division of Ser. No. 780,007, Mar. 22, 1977, Pat. No. 4,170,685, which is a continuation-in-part of Ser. No. 671,058, Mar. 29, 1976, abandoned. This application Oct. 2, 1978, Ser. No. 947,478

Int. Cl.[2] C08F 2/46

U.S. Cl. 427—221 **17 Claims**

1. A method of forming fine-sized microspheres comprising the steps of:

dissolving in aqueous solution up to 35% by weight of an addition copolymerizable monomer mixture consisting essentially of 60 to 80% vinyl pyridine, 10 to 30% of an addition copolymerizable, water soluble, monounsaturated comonomer selected from acrylamide, methacrylamide, acrylic acid, methacrylic acid or compounds of the formula:



where R^1 is hydrogen or lower alkyl of 1–8 carbon atoms, R^2 is alkylene of 1–12 carbon atoms and Z is —OH or

where R^3 or R^4 are individually selected from H, lower alkyl or lower alkoxy of 1–8 carbon atoms; and 5 to 30% of a water-soluble, addition copolymerizable cross-linking agent; and

irradiating the solution with high energy radiation in absence of a chemical catalyst in an amount sufficient to generate free radicals capable of addition polymerizing the monomer mixture to form discrete microspheres, at least 80% of which have a diameter from 100Å to 60 microns, have a surface area of at least 1 m^2/g and consist essentially of the addition copolymerized monomer mixture.

4,224,360

METHOD OF WELDING FOR EXFOLIATION PREVENTION OF STAINLESS STEEL WELD-OVERLAY

Keizo Ohnishi; Takao Adachi; Akiyoshi Fuji, and Ryuichi Chiba, all of Muroran, Japan, assignors to The Japan Steel Works, Inc., Tokyo, Japan

Filed Feb. 9, 1979, Ser. No. 10,774

Claims priority, application Japan, Feb. 9, 1978, 53-12978; Jul. 19, 1978, 53-07093

Int. Cl.[2] B23K 9/04; B21D 51/24

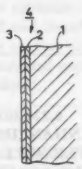
U.S. Cl. 427—239 **5 Claims**

1. A method of welding for prevention of exfoliation of a stainless steel weld overlay metal on a base metal comprising the steps of:

under-laying by welding at least one low alloy steel layer having substantially the same chemical composition as the base metal, said low alloy steel containing niobium of at least eight times the quantity percentage of carbon in the low alloy steel; and

overlaying by welding at least one low austenitic or ferritic stainless steel layer on said underlaid layer, whereby exfoliation of the stainless steel overlay is effectively prevented;

and wherein said base metal defines a surface of a pressure



vessel, said pressure vessel containing hydrogen at a partial pressure of 150 kg/cm^2 or less at a temperature of 450° C. or less and the exfoliation of the stainless steel overlay is due to hydrogen.

4,224,361

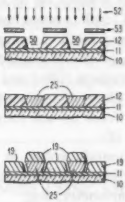
HIGH TEMPERATURE LIFT-OFF TECHNIQUE

Lubomyr T. Romankiw, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 645,852, Dec. 31, 1975, abandoned. This application Sep. 5, 1978, Ser. No. 939,926

Int. Cl.[2] G03C 5/00

U.S. Cl. 427—259 **2 Claims**



1. A method of forming a thin film structure by depositing a material in a vacuum including,

(a) applying a resist upon a metallic substrate,

(b) exposing said resist to radiation selectively and then developing to form patterns of openings in said resist, said resist being exposed and developed to provide tapered walls to said openings, and said openings having the largest cross-sectional area at the exterior surface thereof, said resist with openings comprising a thermally deformable material,

(c) applying energy for heating said resist with openings to cause flow of the edges thereto to round said edges prior to depositing said lift-off material,

(d) plating a metallic lift-off material into said openings to a thickness less than or equal to the thickness of said resist, said lift-off material forming shapes having larger overhanging width at the top of said openings than at the bottom thereof, with a substantial portion of said resist being free of any overhanging lift-off material,

(e) removing the remainder of said resist,

(f) depositing a metal film primary pattern coating material in a vacuum upon the product of step (e) to a thickness substantially less than the thickness of said resist layer, thereby leaving openings between said lift-off material and said coating material to the sides of said lift-off material wherein said metal film is more noble than said metallic lift-off material, and

(g) removing said lift-off material by treating the product of step (f) with an etching solution effective to remove said lift-off material, leaving said more noble metal primary

pattern coating material, with minimal attack upon said primary pattern coating material, whereby said lift-off material has an overhang when plated within said openings in step (d) for facilitating removal of the lift-off material in step (g).

4,224,362

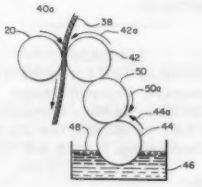
METHOD OF ENHANCING AN EMBOSSED TRANSLUCENT FLEXIBLE SHEET MATERIAL

Larry R. Ramsauer, 5862 Paddon Circle, San Jose, Calif. 95123

Filed Dec. 22, 1978, Ser. No. 972,076

Int. Cl.[2] B05D *5/06*

U.S. Cl. 427—265 **15 Claims**



1. A method of enhancing a translucent flexible sheet material having embossed lenslets on at least one surface thereof wherein each of said lenslets has a height from about 0.001 to about 0.002 inches, said method comprising the steps of:

(a) passing a web of the embossed flexible sheet material between an impression roller and a printing roller having a hardness from about 45 to about 65 Shore A durometer;

(b) depositing ink from an ink fountain onto said printing roller by means of:

(i) rotating a fountain roller in said ink fountain, said fountain roller having a hardness from about 40 to about 80 Shore A durometer, and,

(ii) transferring said ink from said fountain roller to said printing roller by means of an anilox roller having a quad from about 150 to about 300 cells per inch; and,

(c) tipping said lenslets with ink from said printing roller while said web of sheet material passes between said impression and said printing rollers.

4,224,363

MOTOR JACKING APPARATUS

Luciano Veronesi, O'Hara Township, Allegheny County, and Woodie R. Francis, Export, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 8, 1977, Ser. No. 858,862

Int. Cl.[2] F04B *17/00*

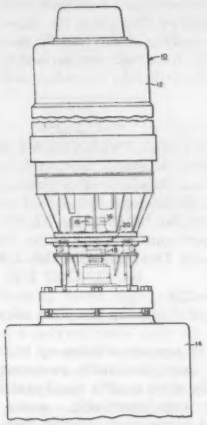
U.S. Cl. 417—360 **8 Claims**

1. A vertical pump comprising:

a pump having a vertical pump shaft and mounted on a stable support for circulating a fluid;

a motor having a vertical drive shaft and mounted on said pump with said drive shaft being removably connected to said pump shaft;

a first jacking mechanism mounted on said pump and extending into contact with said motor for selectively exerting upward force on said motor for vertically moving said motor relative to said pump when said pump shaft has been disconnected from said drive shaft thereby providing area for access to components of said pump while maintaining alignment of said pump shaft and said drive shaft; and



a jacking motor mounted on said pump and connected to said first jacking mechanism for providing power to said first jacking mechanism.

4,224,364

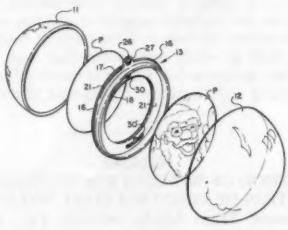
ORNAMENTAL DISPLAY CONTAINER

Bettie W. Hunt, 5217 Carmel Park Dr., Charlotte, N.C. 28211

Continuation-in-part of Ser. No. 935,582, Aug. 21, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 968,294

Int. Cl.[2] A47G *33/08*

U.S. Cl. 428—11 **11 Claims**



1. In a display container having first and second housing sections, at least one of which is transparent, the combination of an improved connecting ring having an axis and comprising oppositely directed annular flanges extending in parallel relation to the axis of the ring and in opposed relation to each other from opposite sides of the ring, each housing section including an edge portion shaped to frictionally overlie one of said annular flanges, and an inner rim extending radially inwardly from said annular flanges and terminating in spaced relation to the axis of the ring to define an opening between the housing sections, whereby the inner rim provides annular support for two-dimensional objects displayed within the container and defines space between the housing sections to display three-dimensional objects.

4,224,365

METHOD OF COATING GLASS CONTAINERS AND PRODUCT

Syed R. Ali-Zaidi, Shippenville, Pa., assignor to Glass Containers Corporation, Fullerton, Calif.

Filed May 15, 1978, Ser. No. 905,898
Int. Cl.[2] B65B *25/34*
U.S. Cl. 428—35 8 Claims

1. A method for coating glass containers after their formation and passage through an annealing lehr and while at an elevated temperature consisting essentially of:

applying to the surface of the glass containers, while at a temperature of between about 200°–400° F., a layer of a composition comprising an aqueous mixture of 1.5 to 4 parts of a polyaminoacrylate ester and 1.5–3 parts of a cross-linking agent therefor, 0.1–0.6 parts of a wax, and a vinyl amino silane coupling agent, said parts being based upon one part of said vinyl amino silane coupling agent.

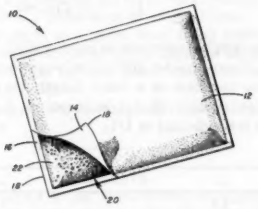
7. A glass container having on the exterior surface thereof a coating having a thickness of between 10–25 microns of a coating composition formed by applying, in a single step, to the exterior surface thereof, at a temperature of 200°–400° F., an aqueous mixture of 1.5 to 4 parts of a polyaminoacrylate ester and 1.5 to 3 parts of a cross-linking agent therefor, 0.1–0.6 parts of a wax, and a vinyl amino silane coupling agent, said parts being based upon one part of said vinyl amino silane coupling agent.

4,224,366

MOISTURE ABSORPTION SECTIONAL PACK

Edward G. McCabe, Jr., 951 Wellesley Rd., Pittsburgh, Pa. 15206

Continuation-in-part of Ser. No. 872,340, Jan. 25, 1978, Pat. No. 4,124,116, which is a continuation-in-part of Ser. No. 768,844, Feb. 15, 1977, abandoned. This application Oct. 19, 1978, Ser. No. 952,809
Int. Cl.[2] B32B *3/00, 3/12, 3/20*
U.S. Cl. 428—72 4 Claims



1. An improved moisture absorption pack comprising,

upper and lower contiguous sheet means bonded to each other at the outermost contiguous edges thereof for forming an enclosure,

barrier means for dividing said enclosure into a plurality of disintegrative sectional compartments initially sealed from each other by said barrier means,

said sectional compartments each forming a separate enclosure containing a predetermined quantity of absorbent granules consisting of alkali metal carboxylate salts of starch-polyacrylonitrile graft copolymers,

said barrier means and said upper contiguous sheet means being a dissolving paper fabricated of a material selected from the group consisting of a water soluble carboxy methyl cellulose compound and a methocel compound,

said lower contiguous sheet means being a moisture or liquid impermeable sheet being fabricated of a mildew resistant sheet,

said dissolving paper being operable to dissolve when said absorbent granules have absorbed a predetermined amount of moisture or liquid, said barrier means between adjacent compartments arranged to disintegrate and break open said sectional compartments to release said absorbent granules from each of said sectional compartments in order to permit freedom of movement of said absorbent granules, and

said upper contiguous sheet means being operable to dissolve in the presence of moisture or liquid and permit freedom of movement of said absorbent granules on said liquid impermeable sheet so that said absorbent granules are free to occupy an increased area to absorb increased amounts of moisture or liquid.

4,224,367

MULTIPLE PLY PACKAGING MATERIAL COMPRISING OUTER PLIES SEALED AROUND AN INNER PLY

William R. Scholle, Corona del Mar, Calif., assignor to Scholle Corporation, Northlake, Ill.

Filed May 22, 1978, Ser. No. 908,386
Int. Cl.[2] B32B *7/04, 7/14, 25/08;* B65D *65/40*
U.S. Cl. 428—76 11 Claims

1. A multiple ply packaging material having improved gas barrier properties, comprising a pair of plies of thermoplastic film and a ply of a substrate film having a metal coating on at least one surface thereof arranged in superimposed relationship with said metal coated substrate ply positioned between said two plies of thermoplastic film, said thermoplastic films being sealed together around their edges to encapsulate said metal coated substrate therewithin.

10. A packaging material having improved gas barrier properties, comprising a pair of plies of thermoplastic material film and a ply of substrate material arranged in superimposed relationship with said substrate material ply positioned between said thermoplastic material plies, said thermoplastic material plies being sealed around their edges to sealingly encapsulate said substrate material ply therewithin, said substrate material ply being a thermoplastic film selected from the group consisting of nylon and polyester.

4,224,368

REFLECTIVE HEAT INSULATING SHIELD, SCREEN, OR PANEL

Ludwik Nowicki, Pl.P. Gaspard, Bay.6, Appt 41, 38029 Grenoble, France

Filed Aug. 2, 1978, Ser. No. 930,202
Claims priority, application France, Aug. 3, 1977, 77 24980; Fed. Rep. of Germany, Aug. 9, 1977, 2735776
Int. Cl.[2] B32B *3/28, 3/30*
U.S. Cl. 428—178 5 Claims

1. A heat reflective heat insulating sheet-like panel positioned between a source of heat and an adjacent body for limiting thermal exchange by radiation and by convection between the source and the body, said panel comprising:

a thin wall having continuous interior and exterior surfaces defined by a plurality of outwardly extending first ledges and by a plurality of first air deflecting members between next adjacent pairs of the ledges, each of the air deflecting members being substantially longer than and extending outwardly from adjacent the base of a corresponding one

of the ledges and terminating adjacent the tip of the ledge next adjacent to said one ledge, and a plurality of second outwardly extending ledges considerably shorter than the first ledges on each of the first air deflecting members and a plurality of second air deflecting members considerably shorter than the first air deflecting members extending outwardly from the base of a corresponding one of the second ledges and terminating adjacent the tip of the second ledge next adjacent to said one second ledge.

4,224,369

METHOD FOR COATING OR PRINTING USING ACRYLATED EPOXIDIZED SOYBEAN OIL URETHANE COMPOSITIONS

George W. Borden, Niantic, Conn.; Oliver W. Smith, South Charleston, W. Va., and David J. Trecker, Old Lyme, Conn., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 343,694, Mar. 22, 1973, which is a division of Ser. No. 103,912, Jan. 4, 1971, abandoned. This application Nov. 6, 1974, Ser. No. 521,511

Int. Cl.[2] B05D *3/06*

U.S. Cl. 428—203 **12 Claims**

1. The method of coating or printing comprising the steps of:

(A) coating or printing on a substrate with a composition comprising:

(I) a liquid vehicle polymerizable to a solid upon exposure to actinic radiation, said vehicle comprising a major proportion of one or more compounds selected from the group of:

(a) the reaction product of epoxidized soybean oil and acrylic acid, having at least two acrylate groups per mole of product, with methyl isocyanate,

(b) the reaction product of epoxidized soybean oil and acrylic acid, having at least two acrylate groups per mole of product, with tolylene diisocyanate,

(II) a photosensitizer for said vehicle, and

(III) a pigment,

(B) exposing the coated or printed substrate to an amount of actinic radiation effective to polymerize said vehicle to form a solid coated or printed surface.

4,224,370

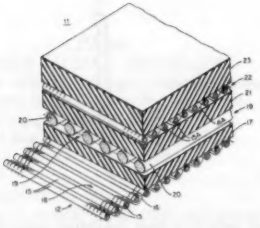
TRANSVERSE STIFFENED SCREEN PRINTING BLANKET

Frederick E. Heinemann, Canton, Mass., assignor to W. R. Grace & Co., Cambridge, Mass.

Filed Jan. 23, 1978, Ser. No. 871,734

Int. Cl.[2] B41N *9/00*

U.S. Cl. 428—246 **12 Claims**



1. A continuous belt screen printing blanket comprising a cylinder ply comprising a transverse stiffening fabric having a plurality of transverse rods with a plurality of longitudinal fibers woven over and under the transverse rods, a rubber layer outwardly of said cylinder ply and having a ply of longitudinally extending cord of high elastic modulus therein, an outer fabric ply outwardly of said rubber layer, and a screen printing working surface outwardly of said outer fabric ply.

4,224,371

SODIUM 3-ACETOXYLMETHYL-7-[2-(2-AMINO-4-THIAZOLYL)-2-METHOXYIMINO-ACETAMIDO]-CEPH-3-EME-4-CARBOXYLATE

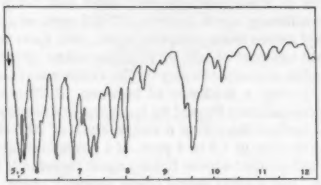
Gaston Amiard, Noisy-le-Sec, France; Dieter Bormann, Kelkheim; Walter Duerckheimer, Hattersheim, both of Fed. Rep. of Germany, and Jean Jolly, Fontenay-sous-Bois, France, assignors to Roussel Uclaf, Paris, France

Filed Aug. 10, 1978, Ser. No. 932,437

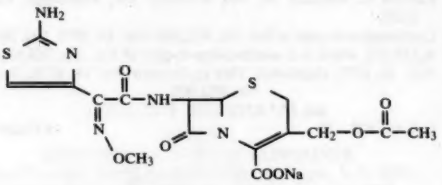
Claims priority, application France, Aug. 17, 1977, 77 25142

Int. Cl.[3] A61K *31/545;* **C07D** *501/34*

U.S. Cl. 424—246 **4 Claims**



1. The stable crystalline hydrate of D form of the syn isomer of sodium 3-acetoxymethyl-7-[2-(2-amino-4-thiazolyl)-2-methoxyimino-acetamido]-ceph-3-eme-4-carboxylate having the formula



having the infrared spectrum in nujol of FIG. 1 and having the following X-ray powder diffraction diagram obtained with the Kα copper radiation at a wave length λ=1.54 A° wherein inter-recticular intervals are indicated as d and the relative intensities are indicated as I/I_1:

d	I/I_1
9.3	0.95
8.8	0.09
6.5	0.07
6.46	0.06
6.10	0.13
5.30	0.25
5.12	0.05
5.03	0.04
4.57	0.04
4.40	0.17
4.20	0.29
3.96	0.70
3.88	0.18
3.76	0.34
3.6	1.00
3.41	0.15
3.27	0.09
3.19	0.11
3.13	0.13
3.10	0.13
3.03	0.15
2.97	0.06
2.78	0.07
2.72	0.04
2.69	0.04
2.60	0.19
2.50	0.11

-continued

d	I/I_1
2.44	0.05
2.40	0.08
2.32	0.09
2.25	0.05

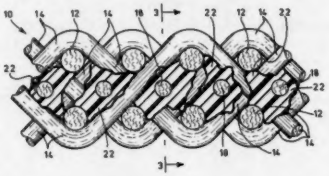
2. An antibiotic composition comprising an antibiotically effective amount of the compound of claim 1 and a pharmaceutical carrier.

4,224,372

PAPER MACHINE CLOTHING HAVING CONTROLLED INTERNAL VOID VOLUME

Eric R. Romanski, Menands, N.Y., assignor to Albany International Corp., Albany, N.Y.

Filed Dec. 26, 1978, Ser. No. 973,023
Int. Cl.[2] D03D *13/00*
U.S. Cl. 428—257 **10 Claims**



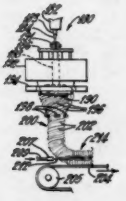
1. A papermaker's fabric, which comprises:
a plurality of crosswise yarns disposed in a plurality of separate layers, each layer being on a plane parallel to the crosswise plane of the fabric;
a plurality of lengthwise yarns interwoven with the crosswise yarns and binding the layers of crosswise yarns together to form a multi-layer of textile fabric;
the crosswise yarns in a given layer being separated from adjacent crosswise yarns in the adjacent layer at points along their length by void spaces within the body of the woven fabric; and
a synthetic, polymeric, thermoplastic resin, cellular foam in void spaces.

4,224,373

FIBROUS PRODUCT OF NON-WOVEN GLASS FIBERS AND METHOD AND APPARATUS FOR PRODUCING SAME

Alfred Marzocchi, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 26, 1978, Ser. No. 972,746
Int. Cl.[2] D04H *1/58*
U.S. Cl. 428—288 **30 Claims**



1. The method of forming a fiber-bonded assemblage of nonwoven glass fibers including advancing a loose assemblage of nonwoven glass fibers, delivering fine discrete binder fibers of glass angularly into the assemblage of nonwoven glass fibers, engaging an air stream with the fine discrete fibers, and wrapping the fine discrete fibers by the forces of the air stream about the fibers of the assemblage bonding the fibers of the assemblage together.

4,224,374

POLYETHER-DERIVED POLYURETHANE FOAM IMPREGNANT AND METHOD OF APPLICATION

David C. Priest, Richmond, Va., assignor to Reeves Brothers, Inc., New York, N.Y.

Filed Nov. 21, 1978, Ser. No. 962,637
Int. Cl.[3] B32B *3/26*; C08L *13/02*
U.S. Cl. 428—310 **18 Claims**

1. A method for rendering polyether-derived polyurethane foam substrates substantially non-flammable comprising:
(a) depositing on the above substrate a fire retardant amount of a water soluble formulation consisting essentially of:
(1) a carboxylated neoprene latex, and
(2) an aluminia trihydrate,
(b) impregnating the substrate with that formulation,
(c) curing the impregnated substrate, and
(d) recovering a substantially non-flammable foam substrate which forms a stable cellular carbonaceous barrier when in contact with a flame.

9. A substantially non-flammable polyether-derived polyurethane foam product produced according to the method of claim 1.

10. The product of claim 9 configurated as a laminate and adhered to a substrate.

4,224,375

IMITATION-LEATHER MATERIAL AND METHOD OF PREPARING SUCH MATERIAL

Manuel J. Veiga, Lowell, and Richard E. Petersen, Concord, both of Mass., assignors to Compo Industries, Inc., Waltham, Mass.

Filed May 22, 1978, Ser. No. 907,974
Int. Cl.[2] B29D *27/00*; B32B *5/18, 31/26*
U.S. Cl. 428—315 **19 Claims**

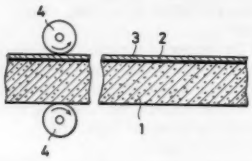
1. In a method of preparing an imitation leather sheet material, which method comprises:
(a) coating a thin, wet foam layer of a foam latex composition onto a flexible sheet material, the latex composition comprising a film-forming, elastomeric, cross-linkable, carboxylated polymer and a cross-linking agent for the carboxylated polymer;
(b) placing a fibrous base steet material onto the top surface of the wet foam latex layer to provide a wet laminate product; and
(c) heating the wet laminate product to dry and cure the foam layer and to provide a dry laminate product, the improvement which comprises:
(i) providing a heat-coagulable, polymeric acidic latex composition as the wet foam layer and wherein the latex composition includes an acid or an acid salt to reduce the pH to less than 5.0, and
(ii) shock-heating the wet foam layer of the wet laminate product by rapidly heating the wet foam layer in a single heating oven operation and in a single temperature step to a temperature of not greater than 450° F. and greater than about 250° F. to heat-coagulate rapidly the acidic polymer to a fine, dense, open-cell foam structure and to remove water rapidly from the coagulated foam layer without blistering of the foam layer to form a dry foam layer and to cross-link the coagulated dried polymer, all during such single temperature step and in such single oven.

4,224,376

PROCESS OF MANUFACTURING A HEAT-RESISTANT COMPOSITE SHEET

Yoshiki Ishige, Tokorozawa; Toshiyuki Kinugasa, Hidaka; Yoshio Ando, Kawagoe, and Shoji Sato, Tokorozawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 3, 1979, Ser. No. 54,628
Claims priority, application Japan, Jul. 7, 1978, 53/81963
Int. Cl.[2] B32B *3/26, 5/18*
U.S. Cl. 428—315 6 Claims



1. A process for manufacturing a heat-resistant composite sheet comprising the steps of coating at least one of the facing surfaces to be adhered of a thermoplastic resin sheet and a polyolefin foam sheet with a bonding agent prepared by adding a cross-linking agent to a hot-melting type bonding agent of the polyester type or of the polyurethane type, and placing the two sheets one upon another at the bonding agent coated layer and subjecting the sheets to heat and pressure so that a cross-linking hardening treatment may be carried out.

4,224,377

REINFORCING MEMBER FOR CASTABLE MATERIAL AND PROCESS OF MIXING REINFORCING ELEMENTS WITH SAID MATERIAL

Joris C. E. Moens, Kortrijk, Belgium, assignor to N. V. Bekaert S.A., Zwevegem, Belgium

Continuation of Ser. No. 456,592, Apr. 1, 1974, abandoned. This application Nov. 10, 1977, Ser. No. 850,246
Claims priority, application United Kingdom, Apr. 16, 1973, 18322/73
Int. Cl.[2] B32B *5/06, 7/00*
U.S. Cl. 428—369 35 Claims

1. A reinforcing member for a castable cementitious matrix material such as mortar and concrete, said reinforcing member comprising a plurality of small elongate metallic fiber reinforcing elements bound together in a group by a binder affectable by a disintegration ingredient suitable to be included in the castable cementitious matrix material for dissociating said elements and wherein each reinforcing element has a thickness between about 0.1 and 1 mm, a length-to-thickness ratio between about 50 and 200 and is constructed of steel, iron or an iron alloy.

4,224,378

ABRASION RESISTANT ORGANOPOLYSILOXANE COATED POLYCARBONATE ARTICLE

Siegfried H. Schroeter, Schenectady, and Daniel R. Olson, Clifton Park, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Nov. 1, 1978, Ser. No. 956,810
Int. Cl.[3] B32B *27/36*
U.S. Cl. 428—412 19 Claims

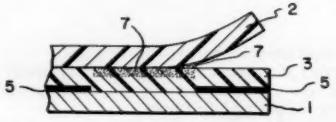
1. A shaped non-opaque coated polycarbonate article having improved mar, scratch, abrasion and chemical solvent resistance comprising a polycarbonate substrate having deposited on the surface thereof (i) an adhesion promoting primer layer consisting essentially of a thermoplastic acrylic polymer; and (ii) a top coat consisting of a thermoset organopolysiloxane disposed on said primer layer, said top coat being tenaciously and uniformly adhered to said polycarbonate substrate by means of said primer layer.

4,224,379

PEELABLE BONDED STRUCTURES AND PROCESS FOR PREPARING SAME

Isao Ichinose, Hiratsuka; Fumio Mori, Yokohama, and Go Kunimoto, Fujisawa, all of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Nov. 29, 1978, Ser. No. 964,615
Claims priority, application Japan, Dec. 8, 1977, 52-146607
Int. Cl.[2] B32B *15/08, 27/32*
U.S. Cl. 428—461 30 Claims



1. A peelable polyolefin-metal bonded structure comprising:
a metal substrate;
a polyolefin layer;
a primer layer disposed between and binding the metal substrate and polyolefin layer, said primer layer comprising:
(a) an olefin resin (A) chemically modified with carbonyl groups at a concentration of between about 0.01 and 200 milliequivalents per 100 g of the modified olefin resin; and
(b) a coating film-forming base resin (B) at an (A)/(B) weight ratio of between about 0.2/99.8 and 70/30,
the primer layer having in at least one first planar region a multi-layer distribution structure with resin concentration gradients in the thickness direction such that the carbonyl group-modified olefin resin is distributed predominantly in the portion of the primer layer contiguous to the polyolefin layer and the base resin is distributed predominantly in the portion of the primary layer contiguous to the metal substrate, and in at least one second planar region a multi-layer distribution structure wherein the modified olefin resin is distributed in the portion of the primer layer contiguous to the polyolefin layer at a distribution ratio lower than the distribution ratio of the modified olefin resin in the portion of the primer layer contiguous to the polyolefin layer in the first planar region; and
a masking layer containing a distribution controlling agent for the carbonyl group-modified olefin resin, said masking layer being disposed between the primer layer and metal substrate and corresponding to and defining said second planar region.

17. A process for preparing peelable polyolefin-metal bonded structures comprising a metal substrate and a polyolefin layer bonded to the metal substrate through a primer paint coating layer, said process comprising:

(a) applying a masking layer containing a distribution con-

trolling agent for an olefin resin chemically modified with carbonyl groups onto at least one predetermined planar region on the surface of the metal substrate;

(b) applying to the masking layer-treated surface of the metal substrate a primer paint comprising the carbonyl group-modified olefin resin (A) containing carbonyl groups at a concentration of between about 0.01 and 200 milliequivalents per 100 g of the modified olefin resin and a coating film forming base resin (B) at an (A)/(B) weight ratio of between about 0.2/99.8 and 70/30 in a mixed solvent containing at least about 70% by weight of a solvent component having a solubility parameter of between about 8.0 and 9.5, said solvent being further characterized in that the difference between the boiling points of the highest and lowest boiling solvent components is at least about 20° C.; and

(c) curing the applied primer paint whereby the carbonyl group-modified olefin resin (A) is distributed predominantly in the surface portion of the primer layer in the planar region other than the masking layer-applied region and the modified olefin resin (A) is distributed in the surface portion of the primer layer in the masking layer-applied planar region at a distribution ratio lower than the distribution ratio of the modified olefin resin (A) in the surface portion of the primer layer in the planar region other than the masking layer-applied region.

4,224,380

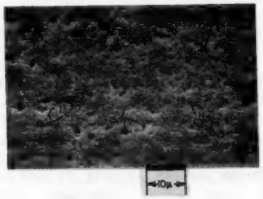
TEMPERATURE RESISTANT ABRASIVE COMPACT AND METHOD FOR MAKING SAME

Harold P. Bovenkerk, and Paul D. Gigl, both of Worthington, Ohio, assignors to General Electric Company, Worthington, Ohio

Continuation of Ser. No. 770,151, Feb. 18, 1977, abandoned. This application Mar. 28, 1978, Ser. No. 890,898

Int. Cl.³ C22C *3/00*; B24D *3/00*

U.S. Cl. 428—545 **16 Claims**



1. A tool component comprising:

(a) self-bonded diamond particles, said particles comprising between about 70% and 95% by volume of said component;

(b) a metallic phase infiltrated substantially uniformly throughout said component, said phase comprising between about 0.05% and 3% by volume of said component and said phase selected from the group consisting of (1) a catalytic metal in elemental form, selected from the group consisting of Group VIII metals, Cr, Mn, Ta; (2) a mixture of alloyable metals of the catalytic metal(s) and non-catalytic metal(s); (3) an alloy of at least two of said catalytic metals; and (4) an alloy of the catalytic metal(s) and non-catalytic metal(s); and

(c) a network of interconnected, empty pores dispersed throughout said component and defined by said particles and said metallic phase, said pores comprising between about 5% and 30% by volume of said component.

6. A tool component comprising:

(a) self-bonded CBN particles, said particles comprising between about 70% and 95% by volume of said component;

(b) a metallic phase infiltrated substantially uniformly throughout said component, said phase comprising between about 0.05% and 3% by volume of said component, and said phase selected from the group consisting of cobalt, cobalt alloys, and alloys of aluminum and an alloying metal selected from the group consisting of Ni, Mn, Fe, V, and Cr; and

(c) a network of interconnected, empty pores dispersed throughout said component and defined by said particles and said metallic phase, said pores comprising between about 5% and 30% by volume of said component.

4,224,381

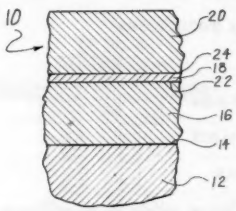
ABRASION RESISTANT MAGNETIC RECORD MEMBERS

Pravin K. Patel, Los Angeles; David H. Johnston, Redondo Beach, both of Calif., and John Makaeff, deceased, late of Los Angeles, Calif. (by Madeleine Makaeff, legal representative), assignors to Poly Disc Systems, Inc., Torrance, Calif.

Continuation-in-part of Ser. No. 918,911, Jun. 26, 1978, abandoned, which is a continuation of Ser. No. 498,952, Aug. 20, 1974, abandoned. This application Oct. 19, 1978, Ser. No. 918,729

Int. Cl.² B32B *15/08*

U.S. Cl. 428—652 **15 Claims**



1. A process of preparing magnetic recording members which comprises:

electrolessly depositing upon an aluminum substrate an amorphous nonmagnetic layer;

said amorphous nonmagnetic layer comprising nickel alloyed with an alloying element chosen from the group consisting of phosphorus, boron, cobalt, and tungsten;

said amorphous nonmagnetic layer deposited in an electroless bath which is maintained rich with respect to said alloying element;

heating said substrate and said amorphous nonmagnetic layer at from about 500° F. to about 620° F. for about one hour to about eight hours to convert said amorphous nonmagnetic layer of said nickel alloy into a hard, semi-crystalline magnetic support layer;

said support layer being richer in nickel near the interface of said substrate and said support layer and richer in the alloying element distal said interface of said substrate and said support layer;

plating said support layer with a nonferrous, non-ferromagnetic shield layer;

plating said shield layer with a nonmagnetic recording layer;

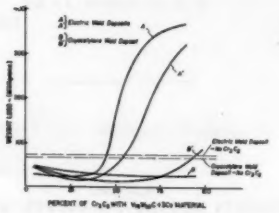
heating said substrate, support layer, shield layer and recording alloy layer at from about 500° F. to about 600° F. for about one to about three hours to convert said nonmagnetic recording layer to a magnetic recording layer.

4,224,382

HARD FACING OF METAL SUBSTRATES

Harry J. Brown, Lewiston, and Kuldip S. Chopra, Grand Island, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,785
Int. Cl.[2] B23K *35/32*; C23C *13/00*
U.S. Cl. 428—656 **3 Claims**



1. In a method for hard facing a surface of an iron base alloy substrate by forming a bond between said surface and a hard-facing material, the improvement which comprises employing as the hard-facing material a composition which consists essentially of chemically combined vanadium, tungsten and carbon in weight proportions of 0.75 VC, 0.25WC and about 5% to 40% by weight of chromium carbide admixed therewith, from 0 to 100% of said chromium carbide being chemically combined with said chemically combined vanadium, tungsten and carbon in the form of a vanadium, tungsten, chromium carbide having the empirical formula:

$$[A\ Cr_{1.5}.\ B\ 0.75V,\ 0.25W]C$$

where

A=0.05 to 0.4

B=0.6 to 0.95

$A+B$=1.0

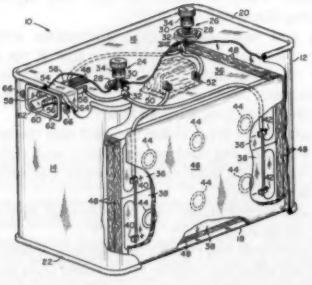
and up to 15% by weight in the aggregate of cobalt, iron, molybdenum and nickel.

4,224,383

RECHARGEABLE BATTERY PACK

Stephen Taylor, South Farmingdale, N.Y., assignor to Power-Lite Industries, Inc., North Babylon, N.Y.

Filed Dec. 26, 1978, Ser. No. 972,807
Int. Cl.[2] H01M *14/00*
U.S. Cl. 429—7 **13 Claims**



7. A rechargeable battery pack,

a housing,

at least one rechargeable power cell in said housing having a normal operating voltage when fully charged,

receptacle means on said housing and electrically communicating with said power cell for connection with a charger with which the power cell is rechargeable when the voltage of said power cell is less than said normal operating voltage,

and charge status indicating means in said housing for parallel electrical connection with said power cell during recharging thereof to provide a positive indication of the presence of said normal operating voltage on said power cell said charge status indicating means including a forward-biased light emitting diode for light emitting conduction when an electric current is passed therethrough,

and a reverse-biased zener diode in series electrical connection with said light emitting diode and having a breakdown voltage selected to that said zener diode permits an electric current to flow through the same and through said light emitting diode for light emitting conduction thereof only when the voltage impressed across said charge status indicating means is substantially equal to said normal operating voltage of the power cell.

4,224,384

SILVER CATALYZED MANGANESE DIOXIDE HYDROGEN GAS ABSORBER

Akiya Kozawa, Middleburg Heights, and Karl V. Kordesch, Lakewood, both of Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Sep. 30, 1975, Ser. No. 618,022
Int. Cl.[2] H01M *10/34*
U.S. Cl. 429—57 **3 Claims**

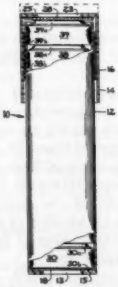
1. In an electrochemical cell having an anode, a cathode, an electrolyte and a hydrogen gas absorber, the improvement wherein the active hydrogen gas absorber component of the hydrogen gas absorber consists of silver catalyzed manganese dioxide.

4,224,385

EXPANDABLE BATTERY CASE

Frank L. Ciliberti, Jr., Ossining, and Gordon E. Kaye, Garrison, both of N.Y., assignors to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 2, 1979, Ser. No. 313
Int. Cl.[2] H01M *2/12, 2/08*
U.S. Cl. 429—66 **8 Claims**



1. A battery case, for containing two or more sealed electrochemical cells subject to expansion or gas venting, said case being adapted to expand to compensate for said cell expansion or gas venting with said case comprising an open ended rigid holder for said cells, an outer overlapping rigid sleeve for said holder, with a first portion of said sleeve covering the open end of said holder and a second portion of said sleeve over-lapping

and spaced from an outer surface of said holder whereby said cells are retained within said holder, and means for adhering said holder and said sleeve with said means permitting relative movement between said holder and said sleeve, said means consisting essentially of an elastomeric adhesive between said outer surface of said holder and said second overlapping portion of said sleeve, with said holder and said sleeve being elastically adhered to each other by said adhesive to an extent whereby upon cell expansion or gas venting said rigid holder and said rigid sleeve move apart to compensate for said expansion or venting with said elastomeric adhesive stretching to maintain adhesion between said holder and said sleeve.

4,224,386

TUBESHEET FOR HOLLOW FIBER TYPE, HIGH TEMPERATURE BATTERY CELLS

Charles A. Levine, Clayton, Calif., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 18, 1979, Ser. No. 58,706

Int. Cl.[2] H01M *2/14*

U.S. Cl. 429—104 **14 Claims**

1. A tubesheet/hollow fiber assembly comprising a wall member with which a plurality of hollow fiber lengths passing therethrough are engaged,

said wall member consisting essentially of a glass having the composition

Na_2O, from about 1 to about 6.1 mole %;

SiO_2, from about 2.5 to about 7.5 mole %; and

B_2O_3, from about 86.5 to about 96.5 mole %; and

said fibers being composed of a ceramic which

has a distortion temperature higher than the fusion temperature of said glass,

has a thermal coefficient of expansion which within the range from 25° C. up to its transistion temperature—does not differ from that of said glass by more than 10×10^{-7} units/°C., and

is capable of sealingly bonding with said glass at said fusion temperature without being fluxed by the glass to such an extent that the flex strength of said fibers is reduced by more than 50%.

4,224,387

BATTERY CONSTRUCTION

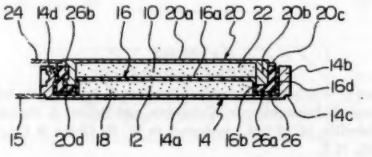
Yasuaki Nakayama, Hanno, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Nov. 17, 1978, Ser. No. 961,782

Claims priority, application Japan, Nov. 21, 1977, 52/156461[U]

Int. Cl.[2] H01M *2/18*

U.S. Cl. 429—133 **7 Claims**



1. A battery construction having a negative active material and a positive active material, comprising:

a cup member having a radial wall and an axial wall provided at an outer periphery of the radial wall;

a cup-shaped separator disposed in said cup member and having a radial wall spaced from the radial wall of said cup member to define therebetween a first compartment to accommodate one of said negative active material and said positive active material, an axial wall formed around an outer periphery of the radial wall of said separator, and a flange portion radially outwardly extending from the axial wall of said separator, said flange portion engaging with the radial wall of said cup member;

a cap member disposed in said cup member and fixedly held thereby, said cap member having a radial wall spaced from the radial wall of said separator to define therebetween a second compartment to accommodate therein another one of said negative active material and said positive active material, an axial wall formed around an outer periphery of the radial wall of said cap member; and

a sealing member fixedly retained between said cup member and said cap member, said sealing member including a radial flange portion compressing the radial wall of said separator toward the radial wall of said cup member;

wherein each of the axial walls of said cup member and said cap member is thicker than each of the radial walls of said cup member and said cap member.

4,224,388

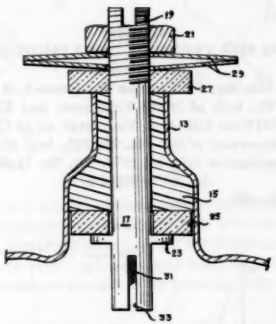
HYDRAULIC SEAL BATTERY TERMINAL

Steven J. Stadnick, Redondo Beach, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 28, 1979, Ser. No. 70,384

Int. Cl.[2] H01M *2/30*

U.S. Cl. 429—181 **3 Claims**



1. A self sealing battery terminal for use on a nickel-hydrogen cell and the like, said terminal comprising a hydroformed outer case having an upwardly extending open ended dome shaped sleeve, a low shear strength sealant material substantially filling the sleeve portion of said hydroformed outer case, a central post extending vertically through said sealant material, said central post having threads on the uppermost end thereof and having a shoulder portion near the lower end thereof, a lower ceramic washer positioned in the lower end of the sleeve around said central post between the shoulder portion thereof and said sealant material, an upper ceramic washer positioned around said central post, the underside of said upper ceramic washer being in contact with the uppermost end surface of the upwardly extending sleeve, a pair of opposite facing Belleville washers positioned on the upper side of said upper ceramic washer, and a nut engaging the threads on said central post for applying a preload tension force to the post whereby the lower ceramic washer acts like a piston to compress the sealant and the Belleville washers maintain the tension above a minimum value.

4,224,389
NON-AQUEOUS PRIMARY CELL

Emanuel Peled, Givatayim, Israel, assignor to Ramot University Authority for Applied Research and Industrial Development Ltd., Tel-Aviv, Israel

Filed Jul. 17, 1978, Ser. No. 925,564
Claims priority, application Israel, Jul. 21, 1977, 52570
Int. Cl.³ H01M 6/16
U.S. Cl. 429—194 **11 Claims**

1. A primary electric cell comprising, in combination:

(a) an anode consisting essentially of a metal selected from alkali metal, calcium and magnesium, and alloys of two or more of said metals which alloys are solid at temperatures up to 75° C.;

(b) a liquid solution having a conductivity of at least 1 $mMho.cm^{-1}$ and comprising:

(i) a non-aqueous cathode consisting of an aprotic, reducible organic compound capable, under the conditions prevailing in the cell, of rapidly reacting with the metal of said anode, so as to form on the surface thereof of a thin, compact insoluble layer of solid electrolyte having $t_{e^-}=0$ and t_{M^+} substantially equal to 1, said aprotic cathode being selected from the group consisting of Freon F 113; 1,1,1-trichloroethane; 1,2-dichloroethane; 1,2-difluoropropane; 1,2-dibromoethane and propylene glycol-1,2-sulfite; and

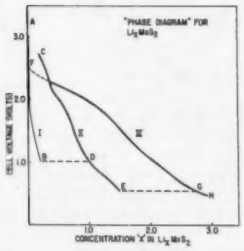
(ii) an electrolyte being a salt of the cation of the metal of said anode and a large complex anion selected from the group consisting of ClO_4^-, BF_4^-, PF_6^-, $AlCl_4^-$, BCl_4^-, and S_8^{--}; and

(c) an inert, porous cathodic collector consisting of carbon or graphite or of compressed carbon or graphite powder.

4,224,390
LITHIUM MOLYBDENUM DISULPHIDE BATTERY CATHODE

Rudolph R. Haering, 647 Croydon Pl.; James A. R. Stiles, 4133 Fairway Pl., both of North Vancouver, and Klaus Brandt, #318 - 1741West 10th Ave., Vancouver, all of Canada

Continuation-in-part of Ser. No. 935,385, Aug. 21, 1978. This application Aug. 30, 1979, Ser. No. 71,395
Int. Cl.² H01M 6/14
U.S. Cl. 429—194 **15 Claims**



1. In an electrolytic cell having a lithium anode, a non-aqueous electrolyte and a cathode, the improvement wherein said cathode comprises material having the chemical formula

$$Li_xMoS_2,$$

where $0<x\leq 3$, which cathode has been conditioned for reversible discharging operation in the cell by discharging the cell to a first cell voltage plateau, further discharging the cell on said first cell voltage plateau, and further discharging the cell to a voltage below said first cell voltage plateau but no less than about 0.6 volts.

4,224,391
ELECTROLYTE FOR ZINC ANODE BATTERIES AND METHOD OF MAKING SAME

Morris Eisenberg, Mountain View, Calif., assignor to Electrochimica Corporation, Mountain View, Calif.

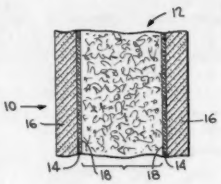
Continuation-in-part of Ser. No. 964,933, Nov. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 880,427, Feb. 23, 1978, abandoned. This application Sep. 14, 1979, Ser. No. 75,408
Int. Cl.³ H01M 6/04
U.S. Cl. 429—203 **18 Claims**

1. A battery having an anode, a cathode and an electrolyte with the anode having zinc or a zinc alloy as an active anodic material, the cathode having a metal oxide or hydroxide as an active cathodic material, and the electrolyte comprising a solution of a salt formed by the reaction of one or more acids selected from the group consisting of boric acid, phosphoric acid and arsenic acid with an alkali or earth alkali hydroxide present in an amount to produce a stoichiometric excess of said hydroxide to said acid in the range of 0.02 to 3.0 equivalents per liter.

4,224,392
NICKEL-OXIDE ELECTRODE STRUCTURE AND METHOD OF MAKING SAME

Harry G. Oswin, Winding Rd., Chauncey, N.Y. 10502

Filed Dec. 16, 1977, Ser. No. 861,421
Int. Cl.² H01M 6/04
U.S. Cl. 429—206 **14 Claims**



10. An electrode comprising a porous carbon matrix having a porosity of at least about 80 percent having deposited on and within said matrix an electrochemically active material selected from the group consisting of zinc, cadmium, lead, nickel, and electrochemically active compounds thereof, and a rigid porous support member on each major surface of said matrix.

4,224,393
BATTERY SEPARATOR

Stewart C. Feinberg, Columbia; Christian B. Lundsager, Ashton; Joseph T. Lundquist, Jr., Columbia, and Robert A. Balouskus, Sykesville, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 10, 1979, Ser. No. 38,007
Int. Cl.³ H01M 2/16
U.S. Cl. 429—251 **7 Claims**

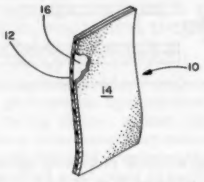
1. A battery separator having high electrical conductivity and inhibition to dendrite formation comprising a substantially uniform sheet formed from a substantially uniform mixture of a thermoplastic rubber and an inert filler having an average particle size of from about 0.01 to 10 microns, the volume ratio of the thermoplastic rubber to filler is from 1:0.15 to 1:0.6 said thermoplastic rubber being a styrene/elastomer/styrene block copolymer having styrene present in from about 15 to 40 weight percent of the copolymer.

4,224,394

ALKALINE BATTERY, SEPARATOR THEREFORE

George F. Schmidt, Neenah, Wis., assignor to Kimberly Clark Corporation, Neenah, Wis.

Filed Jul. 13, 1979, Ser. No. 57,329
Int. Cl.[2] H01M 2/16
U.S. Cl. 429—252 11 Claims



1. An improved battery separator for use in an alkaline battery cell for physically separating electrodes of said cell and for controlling the transfer of ions in an electrolyte solution during chemical reactions of said cell, in which said separator includes an absorber comprised of a flexible and fibrous substrate, resistant to strong alkali and oxidation while holding electrolyte in contact with said electrode and being permeable to the electrolyte ion transfer, said improvement comprising:

a film coating on at least one side of said absorber comprising an admixture of:

(1) a polymeric binder;

(2) a hydrolyzable polyacrylate ester; and

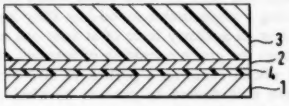
(3) inert fillers; said coating being substantially free of plasticizers and reactive fillers, said polyacrylate ester being of the type which expands when immersed in said electrolyte solution to increase the porosity of said coating during use without the need for reactive fillers to thereby provide a permeable film coating that allows for rapid diffusion of electrolyte ions through said absorber while providing a substantial barrier to electrode ions emitted by said electrodes, whereby voltage loss is reduced and battery cell life is improved.

4,224,395

ELECTROPHOTOGRAPHIC RECORDING MATERIAL WITH CELLULOSE ACYL ESTER BINDER

Wolfgang Wiedemann, Geisenheim-Johannisberg, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 27, 1978, Ser. No. 928,375
Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734289
Int. Cl.[2] G03G 5/06, 5/087, 5/14
U.S. Cl. 430—59 14 Claims



1. In an electrophotographic recording material comprising an electrically conductive support, optionally an insulating intermediate layer, and a photoconductive layer composed of at least one layer comprising charge carrier-producing and charge transporting compounds, a binder, and conventional additives,

the improvement that the recording material comprises a 75 to 250 μm thick support and, in the form of a photoconductor web, is sufficiently flexible that it is not prone to the formation of hairline cracks when repeatedly conducted over rollers of at least 18 mm diameter, said binder being a cellulose acyl ester with an acetyl content of not more than 30 percent and a viscosity of more than 15 poises, measured by the ASTM methods D 817-65, Formula A, and D 1343-56, the ratio between cellulose acyl ester and the charge transporting compound being within the range of about 20 to 60 parts by weight to 80 to 40 parts by weight.

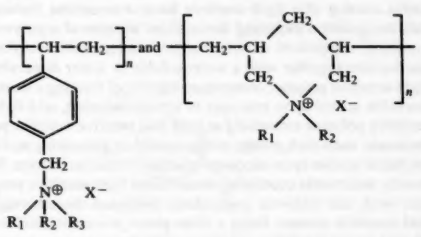
4,224,396

MAGNETIC TONER MATERIALS CONTAINING QUATERNARY AMMONIUM POLYMERS AS CHARGE CONTROL AGENTS

Jean-Claude Pollet, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 2, 1978, Ser. No. 882,713
Int. Cl.[3] G03G 9/14
U.S. Cl. 430—107 8 Claims

1. A field dependent toner of low resistivity for use in an electrophotographic imaging system, the toner being comprised of resin, magnetic pigment, and from between about 0.01 percent by weight and about 10 percent by weight of the toner of a quaternary ammonium polymer having a resistivity of from about 10^6 to 10^{12} ohm/cm, this polymer being selected from the group consisting of those polymers of the following formula:



wherein n is a number of from about 5 to about 2500, R_1, R_2 and R_3 are independently selected from alkyl radicals, and x is a halogen, thereby resulting in full development of the image formed in the electrophotographic imaging process and substantially complete transfer of the toner particles to a substrate.

4,224,397

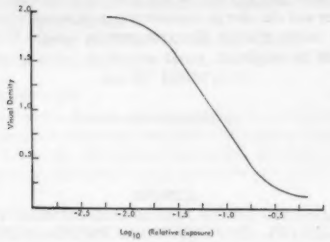
CONTINUOUS TONE DIAZO MATERIAL

Gilbert Zweig, Barrington, R.I., assignor to Trans World Technology Laboratories Inc. (TWT Labs, Inc.), Fiskeville, R.I.

Division of Ser. No. 806,100, Jun. 13, 1977, Pat. No. 4,148,646.
This application Jan. 26, 1979, Ser. No. 6,724
The portion of the term of this patent subsequent to Apr. 10, 1996, has been disclaimed.
Int. Cl.[2] G03C 1/60, 1/78
U.S. Cl. 430—157 8 Claims

1. A diazotype material useful for making duplicates of continuous tone originals comprising a transparent film support and a layer coated thereon consisting essentially of a binder lacquer containing at least two diazonium compounds having different photolysis rates, at least one coupler for the diazonium compounds, a non-photolyzable ultraviolet radia-

tion absorbing material, and homogeneously distributed in said layer at least about 7% by weight of a bulk, broad actinic



radiation-absorbing, inorganic pigment, based upon the amount of lacquer.

4,224,398

PHOTOPOLYMERIZABLE LATEX SYSTEMS

Thaddeus M. Muzyczko, and Daniel C. Thomas, both of Melrose Park, Ill., assignors to Richardson Graphics Company, Orland Park, Ill.

Division of Ser. No. 873,383, Jan. 30, 1978. This application May 29, 1979, Ser. No. 43,478

Int. Cl.[2] G03C *1/58, 1/68;* **C08F** *2/50;* **G03F** *7/08*

U.S. Cl. 430—175 **15 Claims**

1. A lithographic plate having a light-sensitive composition coated thereon, comprising a base lithographic printing plate and a coating of a light-sensitive latex composition thereon, said composition including an emulsion mixture of a polymer emulsion component of water and water-insoluble polymer particulates together with a water-soluble or water dispersible light-sensitive polymer component capable of forming a water-insoluble matrix upon exposure to actinic radiation, said light-sensitive polymer containing at least two reactive moieties per molecule, each such moiety being capable of generating active chemical species upon exposure to actinic radiation to form the matrix, said matrix containing cross-linked light-sensitive polymer with said polymer particulates dispersed therethrough, said emulsion mixture being a three-phase precursor emulsion of said water-insoluble polymer particulates in an aqueous suspension medium containign said light-sensitive polymer, and said emulsion polymer component present at a weight percent ratio range from about 1:10 to 10:1 relative to said light-sensitive component.

4,224,399

PHOTOCROSSLINKABLE COMPOSITIONS FOR LITHOGRAPHIC PRINTING PLATES

Richard E. Merrill, Wakefield, and Arthur A. Massucco, Natick, both of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 770,272, Feb. 22, 1977, abandoned, Ser. No. 958,712, Nov. 8, 1978, and Ser. No. 970,196, Dec. 18, 1978, which is a continuation-in-part of Ser. No. 770,272, , said Ser. No. 958,712, is a division of Ser. No. 770,272, , abandoned. This application Apr. 25, 1979, Ser. No. 33,194

Int. Cl.[2] G03F *7/02;* **G03C** *5/00*

U.S. Cl. 430—282 **8 Claims**

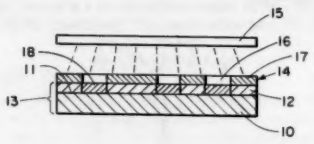
1. A liquid coating composition suitable for forming a radiation-cross-linkable film, comprising

(a) a block copolymer formed of blocks of a copolyacrylate and a polyurethane, said copolyacrylate comprising a copolymer of a hydroxy-containing acrylate and a second acrylate component which comprises one or more esters of a non-hydroxy-containing acrylic acid or methacrylic acid or mixture thereof; and said polyurethane being formed by reacting a diisocyanate with polyoxybutylene to form a "diisocyanate-capped" prepolymer constituent of the said polyurethane;

(b) a solvent for said block copolymer;

(c) an ultraviolet initiator,

(d) at least one cross-linking promoter; and



(e) a wetting/adhesion promoting agent; said coating composition containing from about 5 to about 10 weight percent of said block copolymer and having a viscosity no greater than that which permits coating said composition onto the surface of a printing plate to form a film thereof no greater than about 6μ in thickness.

4,224,400

METHOD OF MANUFACTURING A MAGNETIC HEAD BY PHOTO-ETCHING

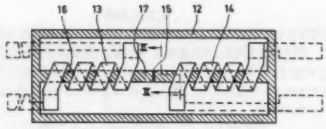
Gerrit J. Koel, and Theodorus C. J. M. Bertens, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 529,362, Dec. 4, 1974, abandoned. This application Jul. 23, 1976, Ser. No. 708,078

Claims priority, application Netherlands, Dec. 14, 1973, 7317143

Int. Cl.[2] G03C *5/00*

U.S. Cl. 430—320 **3 Claims**



1. A method of manufacturing a magnetic head for recording and playing back information which has a generally planar layer having some edges which are substantially perpendicular to the layer and some bevelled edges which comprises:

providing a magnetisable nickel-iron alloy layer;

providing an auxiliary layer of at least one material which belongs the group consisting of titanium, titanium oxide, and silicon oxide on a portion of said nickel-iron layer where it is desired to provide bevelled edges on said nickel-iron alloy layer;

providing a photolacquer layer on said auxiliary layer in a predetermined pattern which corresponds to a predetermined pattern which is desired in said nickel-iron layer, said pattern extending over less than the entire extent of said auxiliary layer;

etching said auxiliary layer and said nickel-iron layer simultaneously in a single etching bath to produce bevelled edges on said nickel-iron layer adjacent to said auxiliary layer and substantially vertical edges where said auxiliary layer is not present, said etching bath containing sulphuric acid, hydrogen peroxide and a fluoride.

4,224,401
SILVER HALIDE PHOTOGRAPHIC EMULSIONS AND IMAGE FORMING PROCESS

Shunji Takada; Yoshitaka Akimura; Hiroyuki Mifune, and Nobuyuki Tsujino, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Continuation-in-part of Ser. No. 804,484, Jun. 7, 1977, abandoned. This application Dec. 7, 1978, Ser. No. 967,546
Claims priority, application Japan, Jun. 7, 1976, 51-66354; Aug. 11, 1976, 51-96341; Nov. 11, 1976, 51-135562
Int. Cl.[2] G03C *5/30*
U.S. Cl. 430—437 **18 Claims**

1. An image forming process which comprises image-wise exposing to light a photographic light-sensitive material comprising a support having thereon at least one silver halide photographic emulsion layer comprising substantially surface latent image type monodispersed silver bromide or silver iodobromide grains containing up to about 10 mol% silver iodide, wherein the average grain size of said silver halide grains is about 0.7 micron or less and a binder in an amount of about 250 g or less per mol of silver halide, wherein said silver halide photographic emulsion layer or at least one other hydrophilic colloid layer on said support contains a compound represented by the general formula (I):

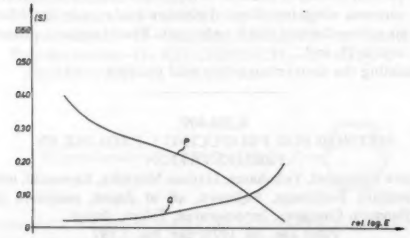
$$R^1NHNHCOR^2 \quad (I)$$

wherein R^1 represents an aryl group and R^2 represents a hydrogen atom, a phenyl group or an unsubstituted straight or branched chain alkyl group having 1 to 3 carbon atoms, and developing said photographic light-sensitive material with a developing solution containing, as a developing agent, a member selected from the group consisting of (a) dihydroxybenzene, (b) dihydroxybenzene plus aminophenol, (c) dihydrozybenzene plus 3-pyrazolidone and (d) dihydroxybenzene plus aminophenol plus 3-pyrazolidone, wherein said dihydroxybenzene is present in an amount of about 0.05 mol/liter to about 0.5 mol/liter, said 3-pyrazolidone is present in an amount of not more than 0.06 mol/liter and said aminophenol is present in an amount of not more than 0.02 mol/liter, and 0.15 mol/liter or more of sulfite ion and having a pH of about 11.0 to about 12.3, wherein the amount of the compound of the general formula (I) is 10^{-4} to 10^{-1} mol/mol Ag.

4,224,402
PHOTOGRAPHIC MATERIAL FOR USE IN THE SILVER COMPLEX DIFFUSION TRANSFER PROCESS

Leon L. Vermeulen, Broechem, and Ludovicus M. Mertens, Borgerhout, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Division of Ser. No. 836,412, Sep. 26, 1977, Pat. No. 4,144,064. This application Oct. 3, 1978, Ser. No. 948,311
Int. Cl.[2] G03C *1/84, 1/48, 5/54*
U.S. Cl. 430—517 **16 Claims**



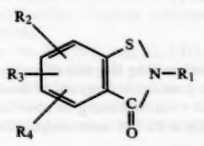
1. A photographic material comprising in order:
(1) a silver halide emulsion layer,
(2) a layer reflecting white light having a dry coating weight in the range of 5 g/sq.m to 20 g/sq.m and containing in an organic hydrophilic colloid binder white inorganic pigment particles in such an amount that said layer has a diffuse transmission density of 0.30 to 0.50 and a reflection density of 0.15 to 0.20,
(3) a subbing layer,
(4) a hydrophobic transparent film support,
(5) a subbing layer, and
(6) an antihalation layer having a dry coating weight in the range of 4 g/sq.m to 15 g/sq.m and containing dispersed in an organic hydrophilic colloid binder a non-bleachable black antihalation substance in such an amount that said layer has a diffuse transmission density of at least 2.

4,224,403
METHOD FOR PREVENTING THE DEGRADATION OF A HYDROPHILIC COLLOID SOLUTION FOR SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Yuzo Toda; Kelichi Adachi; Shoji Ishiguro, all of Minami-ashigara, and Yasuhiro Nakayama, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 3, 1978, Ser. No. 930,842
Claims priority, application Japan, Aug. 3, 1977, 52/93232
Int. Cl.[2] G03C *1/02, 1/34, 1/38*
U.S. Cl. 430—537 **14 Claims**

1. A method for preventing the degradation of a hydrophilic colloid solution by the action of bacteria, mold or yeast for a silver halide photographic light-sensitive material, in which the viscosity of the solution thereof has been or is to be increased using an anionic polymer containing an acid group, whereafter said hydrophilic colloid solution is used in a multicoating process at a speed of about 20 m/min or more, which comprises incorporating into said hydrophilic colloid solution at least one compound represented by the formula (I):



(I)

wherein R_1 represents a hydrogen atom or an alkyl group; and R_2, R_3 and R_4, which may be the same or different, each represents a hydrogen atom, a halogen atom, an alkyl group or an alkoxy group and, increasing said viscosity if said viscosity has not already been increased by the addition of said anionic polymer by adding said anionic polymer containing an acid group to said hydrophilic colloid soluton, whereby said degradation is prevented without any adverse effect on viscosity increase.

4,224,404
PRODUCTION OF SPECIFIC IMMUNE NUCLEIC ACIDS CELL DIALYSATES AND ANTIBODIES

Dimitri Viza, Bourg-la-Reine, France; Dimitri Adamopoulos, Athens, Greece, and John Phillips, L'Hay les Romes, France, assignors to The International Institute of Differentiation Limited, Guernsey, Channel Islands

Filed Dec. 14, 1977, Ser. No. 860,451
Claims priority, application United Kingdom, Dec. 16, 1976, 52674/76
Int. Cl.[2] A01N *1/02*
U.S. Cl. 435—2 **19 Claims**

1. A process for the production of gamma-globulins specific to a given antigen, which process comprises culturing an inducible established cell line of lymphoid origin, which spontaneously produces gamma-globulins, in vitro in the presence of material which is specific to said given antigen and which is selected from:

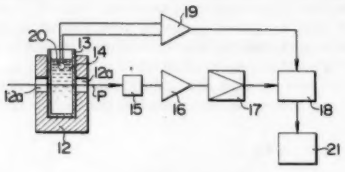
(a) immune nucleic acids obtained from the lymphoid cells of donors sensitised to said given antigen, said donors being selected from humans and animals,
(b) immune nucleic acids obtained from cells of an established cell line culture sensitised to said given antigen by having been cultured with immune nucleic acids or immune dialysates specific to said given antigen,
(c) immune dialysates obtained from the lymphoid cells of donors sensitised to said given antigen, said donors being selected from humans and animals,
(d) immune dialysates obtained from cells of an established cell line culture sensitised to said given antigen by having been cultured with immune nucleic acids or immune dialysates specific to said given antigen, or
(e) the liquid phase of an established cell line culture sensitised to said given antigen by having been cultured with immune nucleic acids or immune dialysates specific to said antigen.

4,224,405

METHOD AND APPARATUS FOR DETERMINING THE RATE OF ENZYME REACTION

Kazuo Hijikata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Apr. 26, 1978, Ser. No. 900,149
Claims priority, application Japan, May 10, 1977, 52/53596
Int. Cl.[2] C12Q *3/00*; C12M *1/40, 1/38*
U.S. Cl. 435—3 **7 Claims**



1. A method of determining the rate of an enzyme reaction in which an enzyme quantity is determined from the rate of a reaction in a reaction solution having an absorbance changing approximately linearly with the time; said method comprising the steps of:
disposing a temperature sensor in the reaction solution for measuring the temperature thereof;
modifying the value of a temperature correction coefficient in accordance with temperature information from said sensor to correct for temperature changes in said reaction solution; and
using said value of said temperature correction coefficient to determine the rate of said enzyme reaction.

4,224,406

IMMUNOCHEMICAL LDH_1 ASSAY

Magdalena U. Gomez, Wayne, and Richard W. Wicks, Belleville, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Feb. 27, 1978, Ser. No. 882,013
Int. Cl.[3] C12Q *1/66, 1/32*
U.S. Cl. 435—7 **5 Claims**

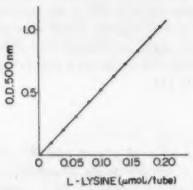
1. An improved method for assaying LDH_1 activity in a serum sample which method comprises the following steps in combination:
(A) mixing and incubating said serum sample with a first antibody immunologically selective for the M subunit of LDH isoenzymes for a short period of time sufficient to forms antibody complexes with LDH_2, LDH_3, LDH_4 and LDH_5 present in said sample;
(B) mixing and incubating the immunological reaction product of step (A) with a second antibody immunogenically produced in an animal species other than the animal species used in producing said first antibody, said second antibody being insolubilized on a solid phase support material, for a short period of time sufficient to form an immunological reaction product between the product of step A and said insolubilized second antibody;
(C) separating said reaction product of step (B) from the supernatant solution; and
(D) assaying the supernatant solution for LDH_1 activity.

4,224,407

ASSAY OF L-LYSINE

Hitoshi Kusakabe, Kyoto; Akira Kuninaka, Choshi, and Kenji Soda, Uji, all of Japan, assignors to Yamasa Shoyu Kabushiki Kaisha, Choshi, Japan

Filed Feb. 26, 1979, Ser. No. 15,177
Claims priority, application Japan, Sep. 22, 1978, 53-115867
Int. Cl.[2] C07G *7/02*
U.S. Cl. 435—25 **5 Claims**



1. A method for determination of L-lysine in a sample, which comprises subjecting L-lysine contained in the sample to decomposition by the use of L-lysine α-oxidase in the presence of oxygen, and determining the quantity of oxygen consumed in the course of the decomposition or the quantity of hydrogen peroxide, ammonia, α-keto-ε-aminocaproic acid or Δ^1-piperideine-2-carboxylic acid produced in the course of the decomposition.

4,224,408

DEOXYRIBONUCLEIC ACID SYNTHESIS USING BINDING PROTEIN

Paul P. Hung, Waukegan, and Shaw-guang Lee, Libertyville, both of Ill., assignors to Abbott Laboratories, Chicago, Ill.

Filed Nov. 22, 1978, Ser. No. 963,245
Int. Cl.[2] C12P *19/34*
U.S. Cl. 435—91 **2 Claims**

1. A method of reverse transcription of the total length of a single stranded ribonucleic acid (RNA) such as Rous sarcoma virus RNA into its complementary deoxyribonucleic acid (cDNA), said method comprising:
incubating Rous sarcoma virus ribonucleic acid in the presence of reverse transcriptase, and nucleic acid binding protein devoid of nuclease activity and isolated from Rous sarcoma virus transformed chicken embryonic fibroblast or untransformed chick embryonic fibroblasts and actinomycin D, and
isolating the deoxyribonucleic acid product.

4,224,409

METHOD FOR PRODUCING L-PROLINE BY FERMENTATION

Shigeru Nakamori, Yokohama; Hajimu Morioka, Kawasaki, and Fumihiro Yoshinaga, Fujisawa, all of Japan, assignors to Ajinomoto Company, Incorporated, Tokyo, Japan

Filed Jan. 30, 1979, Ser. No. 7,782
Claims priority, application Japan, Feb. 1, 1978, 53-10660
Int. Cl.[2] C12P *13/24*
U.S. Cl. 435—107 **9 Claims**

1. A method for producing L-proline by fermentation which comprises culturing an L-proline producing mutant in a culture medium until L-proline is accumulated in the culture

medium, and recovering the accumulated L-proline; said mutant belonging to the genus Brevibacterium, Corynebacterium or Microbacterium and being resistant to DL-3,4-dehydroproline.

4,224,410

METHOD FOR ETHANOL FERMENTATION

Mark S. Pemberton, Shawnee, Kans., and Steven D. Crawford, Independence, Mo., assignors to University of Arkansas Foundation, Fayetteville, Ark.

Filed Dec. 6, 1978, Ser. No. 966,936
Int. Cl.[2] C12P 7/14; C12N 1/16
U.S. Cl. 435—162 3 Claims

1. In a process for the manufacture of alcohol from cellulose by the simultaneous addition of cellulase and a yeast to a cellulose-containing material and isolation and recovery of the resulting ethanol, the improvement which comprises using *Candida brassicae* ATCC 32196 as the yeast.

3. In a process for the manufacture of yeast protein from the growth of a fermentation yeast in a nutrient medium, the improvement of using *Candida brassicae* ATCC 32196 as the yeast.

4,224,411

IMMOBILIZED AMINOACYLASE

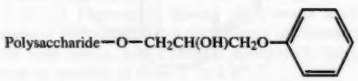
Ichiro Chibata, Suita; Tetsuya Tosa, Kyoto; Takao Mori, Takatsuki; Taizo Watanabe, Nagaokakyo, and Motoki Fujimura, Ikeda, all of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Jun. 2, 1978, Ser. No. 911,995
Claims priority, application Japan, Jul. 12, 1977, 52/83680
Int. Cl.[3] C12N 11/02, 11/10; C12P 13/04
U.S. Cl. 435—177 2 Claims

1. A method for preparing an immobilized aminoacylase preparation which comprises the steps of:

(i) contacting tannin with a water-insoluble, hydrophilic carrier selected from the group consisting of:

Polysaccharide—O—CONH—A—H,
Polysaccharide—O—$CH_2CH(OH)CH_2NH$—A—H,
Polysaccharide—O—$CH_2CH(OH)CH_2O$—A—H,
Polysaccharide—O—$CH_2CH(OH)CH_2$—B—CH_2C-$H(OH)CH_2NH$—A—H,
Polysaccharide—O—CONH—A—NH_2,
Polysaccharide—O—$CH_2CH(OH)CH_2NH$—A—NH_2,
Polysaccharide—O—$CH_2CH(OH)CH_2$—B—CH_2C-$H(OH)CH_2NH$—A—NH_2,
Polysaccharide—O—CONH—A—OH,
Polysaccharide—O—$CH_2CH(OH)CH_2NH$—A—OH,
Polysaccharide—O—$CH_2CH(OH)CH_2O$—A—OH,
Polysaccharide—O—$CH_2CH(OH)CH_2$—B—CH_2C-$H(OH)CH_2NH$—A—OH,
Polysaccharide—O—$CH_2CH(OH)CH_2$—B—CH_2C-$H(OH)CH_2O$—A—OH,
Polysaccharide—O—CONH—A—COOH,
Polysaccharide—O—$CH_2CH(OH)CH_2NH$—A—COOH,
Polysaccharide—O—$CH_2CH(OH)CH_2$—B—CH_2C-$H(OH)CH_2NH$—A—COOH and



wherein A is alkylene having one to 16 carbon atoms which is optionally interrupted by a group selected from the class consisting of —O— and —NH—, B is a group of the formula: $-(CH_2)_n-$ or $-O(CH_2)_nO-$, and n is an integer of 1 to 6, in an aqueous solvent to give a water-insoluble tannin preparation,

(ii) contacting aminoacylase with said water-insoluble tannin preparation in an aqueous solvent to give a water-insoluble tannin-aminoacylase preparation, and

(iii) contacting said water-insoluble tannin-aminoacylase preparation with ferric or ferrous ion in an aqueous solvent.

4,224,412

LIVING VIRUS CULTURE VACCINE AGAINST CANINE DISTEMPER AND METHOD OF PREPARING SAME

Viktor M. Dorofeev, Snaiperskaya ulitsa, 3, kv. 48; Evelina G. Birjukova, Novo-Basmannaya ulitsa, 15, kv. 8; Otar G. Andzhaparidze, Sadovo-Sukharevskaya ulitsa, 8/12, kv. 43; Oleg A. Metelkin, Nikitinskaya ulitsa, 21-2, kv. 48; Evgeny P. Danilov, Samarsky bulvar, 15, korpus 3, kv. 21, and Vera I. Geller, ulitsa Starogo gaya, 1, korpus 3, kv. 20, all of Moscow, U.S.S.R.

Filed May 1, 1979, Ser. No. 35,065
Int. Cl.[2] C12N 7/08
U.S. Cl. 435—237 5 Claims

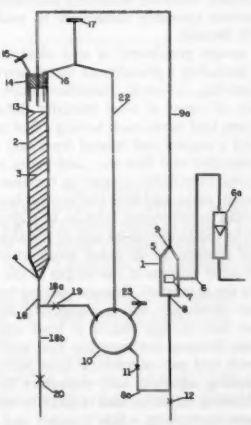
1. A living virus culture vaccine against canine distemper comprising an attenuated strain EPM 10–76 of the virus of canine distemper, said strain being obtained by first isolating the wild virus from the blood of a mink with distemper, and then conducting a series of multiple passages of the wild virus on the following cultures in seriatim: (1) a dog kidney cell culture, (2) a continuous cell culture of the kidneys of human embryo Rh, and (3) a mixed culture consisting of dog kidney cells and Japanese quail embryo cells; adapting the resulting attenuated strain by conducting multiple passages on a Japanese quail embryo cell culture; and cultivating the resultant strain on a Japanese quail embryo cell culture in a suitable culture medium.

4,224,413

CELL CULTURE METHOD

Colin Burbidge, Crawley, England, assignor to Beecham Group Limited, England

Division of Ser. No. 826,761, Aug. 22, 1977, Pat. No. 4,144,126, which is a continuation-in-part of Ser. No. 686,097, May 13, 1976, abandoned. This application Nov. 20, 1978, Ser. No. 962,062
Claims priority, application United Kingdom, May 21, 1975, 21998/75
Int. Cl.[2] C12M 3/00
U.S. Cl. 435—284 4 Claims



1. A cell culturing apparatus comprising a hollow elongated tube having inlet and outlet means distally disposed therein, a solid porous matrix disposed within said elongated vessel be-

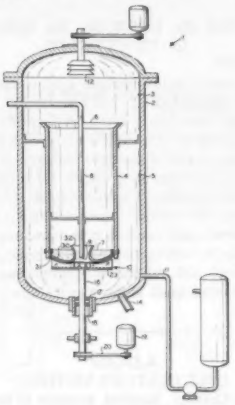
tween said inlet and outlet means, said matrix being operable to support the cells being cultured by adherence to said matrix, means operable to generate a foam from a nutrient medium for said cells, means operable to convey said foam from said foam generating means to said vessel inlet means, and means operable to selectively remove liquid from said outlet means.

4,224,414

FERMENTATION APPARATUS AND METHOD

John W. Vanderveen, and Emil A. Malick, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 16, 1978, Ser. No. 887,279
Int. Cl.[2] C12M *1/04*
U.S. Cl. 435—313 **15 Claims**



1. A fermentation apparatus including:
a vessel defining a fermentation chamber therein;
a draft tube mounted in said chamber and having through openings adjacent opposite ends thereof, said draft tube being spaced from an interior surface of said vessel forming a flow path therebetween;
a shaft having at least a portion thereof positioned in said chamber;
bearing means rotatably mounting said shaft;
motive means operably connected to said shaft to effect rotation thereof;
impeller means positioned in said chamber, said impeller means including a plurality of vanes carried by said shaft and extending outwardly therefrom, adjacent pairs of said plurality of vanes at least partially defining flow paths therefrom, said vanes each having a first end adjacent said shaft and a second end spaced from said shaft outwardly of a respective said first end, said vanes each having first and second boundaries extending between respective first and second ends, said first and second boundaries of each vane being in diverging relation in a direction generally parallel to the longitudinal axis of the shaft from an inner disposed position to an outer disposed position along at least an outer portion of the length of the respective vane wherein the maximum distance spacing between a respective first boundary and a respective second boundary adjacent said second end is at least about 2 times the minimum distance between the first and second boundaries, each said pair of vanes at least partially defining an inlet opening adjacent said respective first ends and an outlet opening adjacent said respective second ends; and
cover means comprising a first member and a second member, said first member having a respective portion adjacent to said first boundaries of adjacent pairs of said plurality of vanes and said second member having a respective portion adjacent to said second boundaries of adjacent pairs of said plurality of vanes to substantially enclose flow paths between said adjacent pairs of vanes.

4,224,415

POLYMERIZATION PROCESSES AND PRODUCTS THEREFROM

Erich F. Meitzner, Glenside, and James A. Oline, Wyncote, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Jul. 18, 1958, Ser. No. 749,526
Int. Cl.[2] C08F *8/00, 12/36;* C08J *5/20*
U.S. Cl. 521—38 **12 Claims**

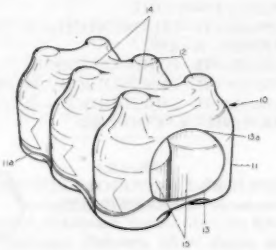
1. In a process for preparing a cation exchange resin having a water-insoluble matrix and cation exchange groups bonded thereto the improvement comprising employing as said matrix a solid copolymer of macroreticular structure which is permeated by small channels or voids into which liquids are able to penetrate, which matrix is prepared by copolymerizing a mixture consisting essentially of (1) a monovinyl carbocyclic aromatic compound or an ester of acrylic or methacrylic acid, with (2) a polyethylenically unsaturated monomer selected from the group consisting of a polyvinyl carbocyclic aromatic compound, an ester of a dihydric alcohol and an α-β-ethylenically unsaturated carboxylic acid, diallyl maleate, and divinyl ketone; the aforesaid copolymerization being conducted while the monomers are dissolved in 25 to 150% by weight, based on monomer weight, of an organic liquid or mixture of organic liquids which is a solvent for said monomers but is unable to substantially swell the copolymers resulting from copolymerization.

4,224,416

DEGRADABLE PLASTIC COMPOSITION CONTAINING AMINE

Lynn J. Taylor, Toledo, and John W. Tobias, Perrysburg, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 865,046, Dec. 27, 1977, which is a continuation of Ser. No. 731,486, Oct. 12, 1976, abandoned, which is a continuation of Ser. No. 288,750, Sep. 13, 1972, abandoned. This application Apr. 10, 1978, Ser. No. 894,869
Int. Cl.[2] C08J *9/00, 9/12, 9/14, 00/00*
U.S. Cl. 521—94 **40 Claims**



1. As a composition of matter, a plastic composition susceptible to chemical degradation in the environment comprising an admixture of an organic polymeric material and at least one organic amine as a readily autoxidizable organic substance substantially uniformly dispersed throughout said organic polymeric material.

4,224,417

HIGH MOLECULAR WEIGHT POLYAMINES AND THEIR USE IN PREPARATION OF POLYURETHANE RESINS

Manfred Hajek, Cologne; Kuno Wagner; Friedrich Möller, both of Leverkusen, and Peter Vehlewald, Leichlingen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 909,158, May 24, 1978, abandoned, which is a continuation of Ser. No. 728,347, Sep. 30, 1976, abandoned.

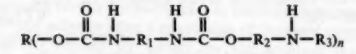
This application Jan. 2, 1979, Ser. No. 52

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1975, 2546536

Int. Cl.[3] C08G *18/32, 18/14;* C07D *273/01*

U.S. Cl. 521—166 3 Claims

1. A process for the production of polyurethane resins wherein polyamines which correspond to the general formula



are reacted with organic diisocyanates and/or polyisocyanates wherein

n represents an integer of between 2 and 10,

R represents an n-valent organic group such as can be obtained by the removal of n hydroxyl groups from a polyhydroxyl compound which has an average molecular weight of between about 200 and about 10,000 and which may contain urethane groups,

R_1 represents an alkylene, cycloalkylene, arylene or aralkylene group having 2 to 15 carbon atoms and

R_2 represents an alkylene, cycloalkylene, arylene or aralkylene group having from 2 to 15 carbon atoms and

R_3 represents hydrogen or an alkyl or cycyloalkyl group having from 1 to 9 carbon atoms or it represents an alkylene group which together with R_2 and —NH— forms a 5-membered or 6-membered [heterocyclic] ring.

4,224,418

COMPOUNDS CONTAINING HYDROXYL GROUPS AND URETHANO-ARYL-SULFONIC ACID GROUPS

Dieter Dieterich; Gerhard Balle, both of Leverkusen, and Hans G. Schmelzer, Pulheim, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 929,615, Jul. 31, 1978, Pat. No. 4,174,434.

This application Jun. 15, 1979, Ser. No. 48,921

Claims priority, application Fed. Rep. of Germany, Aug. 3, 1977, 2735013

Int. Cl.[3] C08L *81/00*

U.S. Cl. 521—170 1 Claim

1. Polyurethanes, comprising:

(A) polyisocyanates; and

(B) hydroxyl compounds having an average molecular weight of 300 to 12,000 and containing a urethanoaryl-sulfonic acid group, said hydroxyl compounds being prepared by reacting at from 0° to 190° C.

(a) compounds having a molecular weight of from 62 to 10,000 having at least two hydroxyl groups; with

(b) aromatic isocyanato sulfonic acids, wherein the equivalent ratio of the total quantity of isocyanate groups (including any isocyanate groups present in dimerized form) to sulfonic acid groups is from 0.5:1 to 50:1 and the equivalent ratio of the sum of the hydroxyl groups in (a) to NCO groups, in (a)+(b) is from 1.5:1 to 30:1.

4,224,419

WEATHERING-RESISTANT, HIGH-IMPACT, EASILY COLORED THERMOPLASTIC COMPOSITIONS

Johann Swoboda, Ludwigshafen; Gerhard Lindenschmidt, Leimen, and Claus Bernhard, Eisenberg, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 17, 1979, Ser. No. 31,011

Claims priority, application Fed. Rep. of Germany, Jun. 20, 1978, 2826925

Int. Cl.[2] C08L *51/04, 33/08*

U.S. Cl. 525—71 10 Claims

1. A mixture which essentially consists of

(A) a first graft copolymer which is formed from

(A1) 55–75% by weight, based on (A), of a crosslinked acrylic ester polymer having a glass transition temperature of below 0° C. and a mean particle diameter (weight average) of from 50 to 150 nm, as the grafting base, onto which are grafted

(A2) from 45 to 25% by weight, based on (A), of a mixture of styrene and acrylonitrile in the weight ratio of from 80:20 to 65:35,

(B) a second, separately prepared graft copolymer which is formed from

(B1) 60–80% by weight, based on (B), of a crosslinked acrylic ester polymer having a glass transition temperature of below 0° C. and a mean particle diameter (weight average) in the range from 200 to 500 nm, as the grafting base, onto which are grafted

(B2) 40–20% by weight, based on (B), of a mixture of styrene and acrylonitrile in the weight ratio of from 80:20 to 65:35, and

(C) a hard component consisting of one or more copolymers of styrene and/or α-methylstyrene with acrylonitrile, which copolymers contain 20–40% by weight of acrylonitrile as copolymerized units,

with the proviso that in the mixture ((A)+(B)+(C)) the weight ratio of the grafting bases (A1):(B1) is from about 90:10 to 35:65, and the proportion of the sum of the two grafting bases ((A1)+(B1)) is from about 10 to 35% by weight, based on the total mixture ((A)+(B)+(C)).

4,224,420

PREPARATION OF POLYMERIC ACETAL CARBOXYLATES USING MOLECULAR SIEVES

Victor D. Papanu, Maryland Heights, and Charles J. Upton, Ballwin, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Jun. 18, 1979, Ser. No. 49,991

Int. Cl.[2] C08F *283/06;* C08G *6/00*

U.S. Cl. 525—401 16 Claims

1. A process which comprises:

(a) bringing together in a reaction zone under polymerization conditions an ester of glyoxylic acid and a molecular sieve; and

(b) adding an alkyl vinyl ether containing 3 to about 18 carbon atoms to the resulting polymer in the presence of the molecular sieve to stabilize the polymer against rapid depolymerization in alkaline solution.

4,224,421
WATER-SOLUBLE, CROSSLINKED NITROGEN-CONTAINING CONDENSATION PRODUCTS

Werner Streit, Bobenheim; Rolf Fikentscher; Karl Gans, both of Ludwigshafen; Gerhard Welzel, Mannheim; Klaus Glaser, Mutterstadt, and Emil Schaefer, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

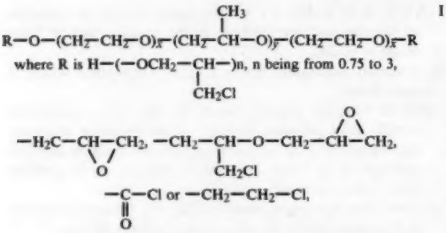
Filed Jul. 3, 1978, Ser. No. 921,221

Claims priority, application Fed. Rep. of Germany, Jul. 28, 1977, 2733973

Int. Cl.[2] **C08G** *65/22, 65/26*

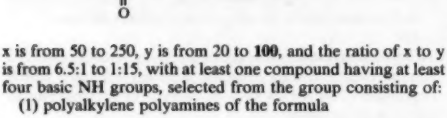
U.S. Cl. 525—403 **4 Claims**

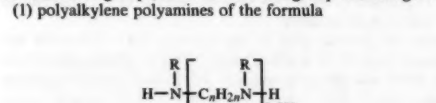
1. A water-soluble, crosslinked nitrogen-containing condensation product, the viscosity of which, in aqueous solution, increases with increasing temperature, obtained by reacting a block copolymer of the formula:



I

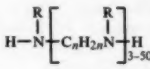
where R is H—(—OCH_2—CH(—CH_2Cl)—)n, n being from 0.75 to 3,





x is from 50 to 250, y is from 20 to **100**, and the ratio of x to y is from 6.5:1 to 1:15, with at least one compound having at least four basic NH groups, selected from the group consisting of:

(1) polyalkylene polyamines of the formula



wherein R is H, alkyl of 1 to 4 carbon atoms, alkylsulfonate of 1 to 6 carbon atoms or —CH_2—COOH, and n is 2–4;

(2) condensation products of ammonia or an amine with ethylene chloride, ephichlorohydrin, or a short-chain dichlorohydrin ether, the viscosity of the condensation products being at most 2,500 m Pas, measured in 50% strength aqueous solution at 20° C., and

(3) condensation products of a polyamine, having 3 to 10 basic nitrogen atoms per molecule, with a dicarboxylic acid of 4 to 10 carbon atoms, the viscosity of the condensation products being at most 2,500 m Pas, measured in 50% strength aqueous solution at 20° C., in a polar solvent at a temperature of from 20° to 180° C. in a weight ratio of from 0.8:1 to 30:1.

4,224,422
MODIFIED EPOXY RESIN-POLYISOCYANATE RESIN SYSTEM

Harold E. Rude, Roseville, and Richard G. Newell, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jun. 28, 1979, Ser. No. 52,847

Int. Cl.[2] **C08G** *59/40, 18/04*

U.S. Cl. 525—454 **26 Claims**

1. A curable liquid resin system which comprises

(A) 0.01–5.0 parts of one or more Lewis acids,

(B) 1–30 parts of one or more polyols which are liquid or soluble waxy solids having hydroxy equivalent weight of from about 30 to 2000,

(C) 1–50 parts of one or more polyisocyanates having equivalent weights of up to about 380 and functionalities of from about 2 to about 6,

(D) 20–90 parts of one or more epoxy resins having epoxide functionalities greater than one and which are substantially free of hydroxyl groups and

(E) 1–40 parts of one or more cationically polymerizable ethylenically unsaturated monomers,

the sum of (A), (B), (C), (D) and (E) being 100 parts.

4,224,423
RESIN MANUFACTURE

Dennis H. Ogden, Wolverhampton, and George Inverarity, Kingswinford, both of England, assignors to British Industrial Plastics Limited, England

Filed Jun. 2, 1978, Ser. No. 911,870

Claims priority, application United Kingdom, Jun. 11, 1977, 24458/77

Int. Cl.[3] **C08L** *61/24, 61/28;* **C08G** *12/12, 12/32*

U.S. Cl. 525—515 **9 Claims**

1. A method for the manufacture of an amino-formaldehyde resin of low water content which comprises reacting at a temperature above 60° C. in a liquid phase an amino compound with formaldehyde in a reaction system using as solvent an amino-formaldehyde resin which reacts with further monomers and which resin is in the form of one of a liquid resin and an aqueous solution of at least 50% solids content, and renders the mixture of reactants liquid at least at the temperature at which the reaction is to be carried out, the amino compound and the formaldehyde being introduced into said solvent in a solid form, neither dissolved nor dispersed in water, no further water being added to the reaction mixture to dissolve said amino compound and formaldehyde, said amino compound and formaldehyde being added to the solvent separately under alkaline conditions, the reaction mixture when all three ingredients are at present being reacted under alkaline or acidic conditions, as appropriate, to obtain a desired reaction rate, and the final product being subsequently neutralized or made alkaline before storage.

4,224,424
PRETREATMENT OF A REACTOR WITH ALKALI METAL CARBONATE AND BICARBONATES TO REDUCE WALL FOULING IN VINYL CHLORIDE POLYMERIZATION

Bernard D. Bauman, Plymouth Meeting, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 1, 1978, Ser. No. 939,020

Int. Cl.[3] **C08F** *14/06*

U.S. Cl. 526—62 **9 Claims**

1. In a suspension polymerization process wherein a recipe comprising vinyl chloride or a mixture of vinyl chloride and another vinyl monomer, water, a suspension agent, and a monomer soluble polymerization catalyst is charged to a stainless steel reactor at an initial pH of 6.0 or above, and subsequently polymerized at an elevated temperature to produce a vinyl chloride containing polymer, the improvement for reducing wall fouling in said stainless steel reactor which comprises:

(a) wetting the internal reactor surface with a solution comprising a solvent and an alkaline material selected from the group consisting of alkali metal carbonates and alkali metal bicarbonates, said carbonate material being incorporated in said solution in a proportion of from about 1.25 to 25% by weight and said bicarbonate being incorporated in said solution in a proportion of from about 5 to 25% by weight and

(b) heating the wet reactor surface to a temperature of 40°–100° C. for a period of at least five minutes prior to charging the recipe to the reactor.

4,224,425
PARTIAL POLYMERIZATION METHOD FOR VINYL MONOMERS

Peter Buergle, Darmstadt; Karl Maurer, Lautertal; Manfred Munzer, Bensheim; Wilhelm Rosskopp, and Franz Wenzel, both of Darmstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Apr. 9, 1979, Ser. No. 28,436

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1978, 2817754

Int. Cl.[2] C08F *2/02, 2/42, 4/34, 20/14*

U.S. Cl. 526—85 **7 Claims**

1. A method for making an organic glass which comprises first initiating the partial polymerization, in bulk, of a vinyl monomer which is methyl methacrylate or a mixture consisting of at least 80 **l percent by weight of methyl methacrylate with the balance being other vinyl monomers copolymerizable therewith, with a percarbonic acid ester to form a partially-polymerized mixture of said vinyl monomer with a polymer thereof, inhibiting further polymerization in the desired mixture of monomer and polymer after a conversion of the vinyl monomer of at least** 20 percent by weight by the addition thereto of a thioether, an organic disulfide, or a mercaptan, and then further polymerizing said partially-polymerized mixture to form said organic glass.

4,224,426
POLYMERIZATION PROCESS FOR CIS-1,4-POLYBUTADIENE USING CYCLOALKANE SOLVENTS AND AN AROMATIC POLYMERIZATION REGULATOR

Joseph Odar, South Euclid, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Nov. 13, 1978, Ser. No. 960,388

Int. Cl.[2] C08F *36/06*

U.S. Cl. 526—92 **12 Claims**

1. An improved process of polymerizing butadiene-1,3 to produce primarily linear, gel-free cis-1,4-polybutadiene which is carried out in the presence of a catalyst comprising a cobalt compound, at least one organo-aluminum compound and water, the improvement which comprises carrying out the polymerization reaction in a cycloalkane having 5 to 8 carbon atoms containing 0 to 80 percent, based on the weight of cycloalkane, of a secondary solvent selected from the group consisting of a saturated aliphatic hydrocarbon and an α-monoolefin having 4 to 10 carbon atoms and from 0.1 to 2 percent, based on the weight of total solvent, of an alkyl substituted benzene having 1 to 4 alkyl substituents of 1 to 4 carbon atoms.

4,224,427
PROCESS FOR PREPARING HYDROGELS AS SPHERICAL BEADS OF LARGE SIZE

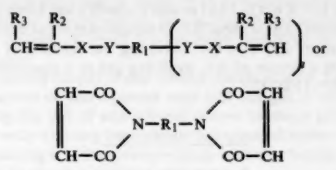
Karl F. Mueller, New York; Sonia J. Heiber, Bedford Hills, and Walter L. Plankl, Yorktown Heights, all of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 817,404, Jul. 20, 1977, abandoned. This application Jun. 1, 1978, Ser. No. 911,636

Int. Cl.[3] C08F *2/18*

U.S. Cl. 526—93 **26 Claims**

1. An improved process for preparing essentially uniform spherical beads of up to 5 mm diameter of a crosslinked, water-insoluble hydrogel by suspension polymerization of (A) 95 to 30% by weight of the hydrogel of a water-soluble monoolefinic monomer or mixture of said water-soluble monomers, and from 0 to 70% by weight based on the total monomer of a water-insoluble monoolefinic monomer or mixture of said water-insoluble monomers, with the proviso that the final hydrogel does not contain over 60% by weight of said water-insoluble monomer components, with (B) 5 to 70% by weight of the hydrogel of a polyolefinic crosslinking macromer of the formula



wherein a is 1 or 2, R_1 is a polycondensate chain having a molecular weight from about 200 to about 8,000 which contains hydrocarbon residues connected via ether, ester, amide or urea linkages or is a polysiloxane of molecular weight between 400 and 8,000; R_2 is hydrogen, methyl or $—CH_2COOR_4$; R_4 is hydrogen or alkyl of 1 to 10 carbon atoms; R_3 is hydrogen or $—COOR_4$ with the proviso that at least one of R_2 and R_3 is hydrogen; X is an oxygen atom, —COO— or $—CONR_5$; R_5 is hydrogen or alkyl of 1 to 5 carbon atoms; Y is a direct bond or the radical $R_6—Z_1—CONH—\ R_7NHCO—Z_2—$; R_6 is linked to X and represents branched or linear alkylene of 1 to 7 carbon atoms; Z_1 is an oxygen atom or $—NR_5—$; Z_2 is Z_1 or a sulfur atom; and R_7 is the diradical of an aliphatic, alicyclic or aromatic diisocyanate with the proviso that in case X is oxygen, Y is different from a direct bond and R_2 and R_3 are hydrogen, with a polymerization initiator in a concentrated aqueous inorganic salt solution wherein the improvement comprises

carrying out the suspension polymerization with monoolefinic monomers containing at least 5% by weight of the total monomers of a hydroxy substituted hydrophilic vinyl monomer;

employing as the crosslinking agent a polyolefinic macromer having a molecular weight from about 400 to about 8,000 and

utilizing from 0.01 to 5% by weight, based on the hydrogel, of a suspending agent selected from the water-insoluble, gelatinous, strongly water-bonding, inorganic metal hydroxides and metal hydroxy salts in the absence of excess alkali or free hydroxyl ions.

4,224,428
POLYMERIZATION PROCESS

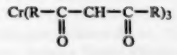
William Kirch, and Paul A. Thompson, both of Clinton, Iowa, assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 925,417, Jul. 17, 1978. This application Feb. 2, 1979, Ser. No. 8,757

Int. Cl.[2] C08F *4/22, 4/24, 4/78*

U.S. Cl. 526—106 **10 Claims**

1. The method of making polymers of 1-olefins of 2–8 carbon atoms and copolymers of said olefins and 1-olefins of 2–20 carbon atoms which comprises polymerizing said olefins under polymerizing conditions with a catalyst prepared by the process of (1) forming a mixture of a finely divided, difficultly reducible, support of the class consisting of silica, alumina, zirconia, thoria, magnesia and mixtures thereof and a $chromium^{+3}$ derivative of a beta-dicarbonyl compound of the formula



or a chromic carboxylate of the formula $Cr(OOCR)_3$ in an amount to provide about 0.1–30 weight percent of chromium in said catalyst, wherein each R is individually selected from hydrogen or a hydrocarbyl group of 1–20 carbon atoms, (2) heating the mixture of (1) in a stream of dry, inert, and non-oxidizing gas to a temperature of about 230°–540° C., and then (3) forming a second combination by adding a titanium compound to the product of (2) at a temperature ranging from 95°–370° C., said titanium compound having the formula $(R')_nTi(OR')_m$ or $(R'O)_mTi(OR')_n$ in which R' is the same or different and is

hydrogen or a hydrocarbyl group of 1–12 carbon atoms and in which m is 1–4, n is 0–3 and m plus n equals 4 and being present in an amount to give about 0.5–10 weight percent of titanium in said catalyst, and then (4) activating the mixture of (3) by heating in a stream of dry, oxidizing gas to a temperature of about 370°–1100° C.

4,224,429

PROCESS FOR THE ANIONIC POLYMERIZATION IN THE PRESENCE OF CRYPTANTS

Jean-Marie Lehn, Strasbourg; Francois Schue, Lutzelhouse; Sylvie Boileau, Paris; Alain A. Cau, Loire; Bernd Kaempf, Strasbourg; Jean R. Moinard, Vert le Petit, and Serge F. Raynal, Villejuif, all of France, assignors to Societe Nationale des Poudres et Explosifs, Paris, France

Continuation-in-part of Ser. No. 539,729, Jan. 9, 1975, Pat. No. 4,116,887, which is a division of Ser. No. 401,119, Sep. 26, 1973, Pat. No. 3,890,278. This application Aug. 11, 1977, Ser. No. 823,590

Claims priority, application United Kingdom, Oct. 3, 1972, 45482/72; Jul. 30, 1973, 36257/73

The portion of the term of this patent subsequent to Jun. 17, 1992, has been disclaimed.

Int. Cl.[2] **C08F** *4/46, 4/50;* **C08G** *63/10, 65/12, 77/08, 63/62*

U.S. Cl. 526—183 **17 Claims**

1. A process for the anionic polymerization or copolymerization of monomers containing ethylenic unsaturation and heterocyclic monomers which comprises reacting at least one monomer which is a vinyl monomer or an heterocyclic monomer with a catalyst capable of inducing anionic polymerization and an aprotic macroheterocyclic cryptant, said at least one monomer being the only medium for the reaction, said macroheterocyclic cryptant being heterobicyclic, heterotricyclic or heterotetracyclic and containing as heteroatoms: (1) N; (2) N and O; (3) N, S and O; (4) N and S, said cryptant being able of forming a cryptate after entrapping a cation.

4,224,430

RESINOUS COMPOSITION

Iwao Maekawa; Isao Uchigasaki; Shouzi Takamizawa, and Akira Kageyama, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

Filed Apr. 28, 1977, Ser. No. 792,003

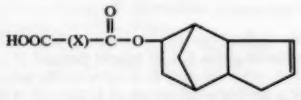
Claims priority, application Japan, Jan. 25, 1977, 52-6935

Int. Cl.[2] **C08F** *36/00, 236/00*

U.S. Cl. 526—282 **18 Claims**

1. A resinous composition comprising:

(1) 40–90 parts by weight of one or more oligomers obtained by reacting by a condensation reaction 0.8 to 1.2 moles of a polyhydric alcohol with 1 mole of a monobasic acid of the formula,



wherein X is an α,β-unsaturated hydrocarbon group having 2 or 3 carbon atoms, and

(2) 10–60 parts by weight of one or more polymerizable monomers having at least one polymerizable double bond in the molecule.

4,224,431

HETEROCYCLIC NYLON-1 TYPE POLYMERS

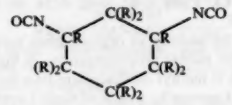
Herbert L. Heiss, New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1979, Ser. No. 8,450

Int. Cl.[2] **C08G** *18/02, 18/18, 18/26, 18/75*

U.S. Cl. 528—48 **6 Claims**

1. A process for the production of polymers comprising: reacting (a) cycloaliphatic diisocyanates of the formula



where R is hydrogen or an aliphatic hydrocarbon group having from 1 to 4 carbon atoms, at least one of said R's being an aliphatic hydrocarbon having from 1 to 40 carbon atoms and the isocyanato groups must both be positioned axial or equatorial; and

(b) catalysts selected from the group consisting of lead catalysts, tertiary amines, alkali metal hydroxides, and sodium methoxide.

4,224,432

POLYURETHANES PREPARED WITH TETRAHYDROFURAN-ALKYLENE OXIDE POLYMERIZATES HAVING LOW OLIGOMERIC CYCLIC ETHER CONTENT

Engelbert Pechhold, Chadds Ford, Pa., and Ivan M. Robinson, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 915,191, Jun. 13, 1978, abandoned. This application Dec. 11, 1978, Ser. No. 966,602

Int. Cl.[3] **C08G** *18/48*

U.S. Cl. 528—76 **10 Claims**

1. A polyurethane which is the reaction product of

(A) a polymerizate of tetrahydrofuran and an alkylene oxide whose ring contains two or three carbon atoms, the polymerizate containing no more than about 3%, by weight, of oligomeric cyclic ethers;

(B) an organic polyisocyanate; and,

(C) a chain extender which is an aliphatic polyol or a polyamine.

4,224,433

THERMOTROPIC POLYESTERS OF 2,6-DIHYDROXYANTHRAQUINONE

Gordon W. Calundann, N. Plainfield, and Larry F. Charbonneau, Chatham Morris, both of N.J., assignors to Celanese Corporation, New York, N.Y.

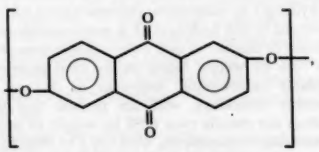
Filed Mar. 16, 1979, Ser. No. 21,050

Int. Cl.[2] **C08G** *63/06, 63/18, 63/60*

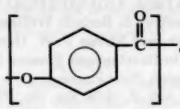
U.S. Cl. 528—128 **21 Claims**

1. A melt processable wholly aromatic polyester capable of forming an anisotropic melt phase at a temperature below approximately 375° C. consisting essentially of moieties I, II, and III wherein:

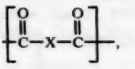
I is



II is



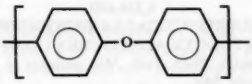
and
III is



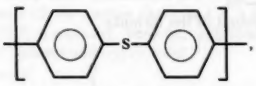
where X is selected from at least one member of the group consisting of

(a) 1,3-phenylene radicals which optionally are replaced with up to 75 mole percent of 1;4-phenylene radicals based upon the total concentration of 1,3-phenylene and 1,4-phenylene radicals present in said polyester,

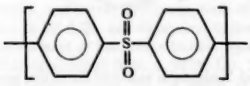
(b)



(c)



and
(d)



and wherein said polyester comprises approximately 15 to 30 mole percent of moiety I, approximately 35 to 70 mole percent moiety II, and approximately 15 to 30 mole percent of moiety III.

4,224,434

CONTINUOUS PROCESS FOR PRODUCING HALOGENATED POLYCARBONATES AND THE POLYCARBONATES OBTAINED THEREFROM

Clayton B. Quinn, Mt. Vernon, Ind., and Charles A. Wilson, II, Greenville, S.C., assignors to General Electric Company, Pittsfield, Mass.

Filed Feb. 28, 1978, Ser. No. 882,192
Int. Cl.[2] C08G *63/62*
U.S. Cl. 528—199 **8 Claims**

1. A continuous process for obtaining highly pure, high molecular weight aromatic polycarbonates containing predetermined statistical mixtures of unreacted diphenol, monohalodiphenol and dihalodiphenol, said process consisting essentially of

dissolving or suspending a diphenol in a solvent system comprising water and a primary solvent system member of the group consisting of methylene chloride and chlorobenzene, the weight ratio of said primary solvent system member to said diphenol being in the range of about 2:1–6:1 and the weight ratio of water to said diphenol being in the range of about 2:1–5:1; introducing a halogen into said solvent system, said halogen being introduced in an amount of about 0.1–2.0 moles per mole of said diphenol;

maintaining the pH of said solvent system at pH 2–5 until the reaction of said diphenol with said halogen is complete;

raising the pH of said solvent system to about pH 11 and directly reacting the resultant halogenated diphenol while retaining it in the solvent system with a carbonate precursor to obtain a polymer mixture; and,

phase separating said polymer from said polymer mixture to recover said polycarbonate therefrom.

4,224,435

METHOD FOR MIXING RAW MATERIALS FOR PRODUCING OXYMETHYLENE COPOLYMERS

Akitoshi Sugio, Omiya; Akira Amamiya, Tokyo; Tadashi Kunii, Yotsukaichi; Tomotaka Furusawa; Mutsuhiko Takeda, both of Matsudo; Katsumasa Tanaka, Yotsukaichi; Toshikazu Umenura, Tokyo, and Kiyokazu Kawaguchi, Matsudo, all of Japan, assignors to Mitsubishi Gas chemical Company, Inc., Tokyo, Japan

Filed Jun. 13, 1979, Ser. No. 48,178
Claims priority, application Japan, Jun. 13, 1978, 53-070307
Int. Cl.[3] C08G *2/10*
U.S. Cl. 528—232 **10 Claims**

1. In a method for mixing a trioxane, a polymerization catalyst and a comonomer for producing of oxymethylene copolymers by continuously copolymerizing trioxane with a cyclic ether or a cyclic acetal as a comonomer, the improvement which comprises:

spouting a comonomer and a polymerization catalyst from nozzle openings which are set adjacent to each other,

while washing both openings at the tip end of the nozzles with a flow of trioxane,

whereby mixing said comonomer, said polymerization catalyst and said trioxane,

and then feeding the mixture to a polymerization reactor to effect copolymerization.

4,224,436

ORGANO SELENIUM AND/OR ORGANO TELLURIUM CURING AGENT FOR MERCAPTAN POLYMER-CONTAINING SEALANT

Richard C. Doss, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1979, Ser. No. 39,060
Int. Cl.[2] C08G *63/14, 63/68*
U.S. Cl. 528—275 **10 Claims**

1. A sealant composition comprising a mercaptan-terminated polyether-polyester liquid polymer and at least one of an organo selenium and an organo tellurium curing agent or compound.

4,224,437

PROCESS FOR PREVENTION OF FOAMING WHEN STEAM-STRIPPING RESIDUAL MONOMER FROM AQUEOUS POLYMER DISPERSIONS

Kai Rostock, Burghausen; Johann Birke, Marktl; Rudolf Wiedholz, Burghausen; Johann Bauer, Burghausen, and Thomas Balwe, Burghausen, all of Fed. Rep. of Germany, assignors to Wacker-Chemie GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 21, 1978, Ser. No. 944,404
Claims priority, application Fed. Rep. of Germany, Oct. 3, 1977, 2744462
Int. Cl.[2] C08F *6/16, 6/24*
U.S. Cl. 528—500 **3 Claims**

1. In the process for steam stripping residual monomer from an aqueous polymer dispersion prepared in an autoclave comprising injecting steam into an aqueous polymer dispersion

containing polymers selected from the group consisting of polyvinyl chloride and copolymers of at least one monomer copolymerizable with vinyl chloride and from 5% to 95% by weight of vinyl chloride, and from 0.01% to 2% by weight of emulsifiers and/or from 0.05% to 2% by weight of protective colloids, said dispersion having a solids content of from 15% to 55% by weight with simultaneous evacuation of the gas space above the dispersion whereby said gas space is maintained at a subatmospheric pressure and said residual monomers are volatilized, the improvement consisting of injecting a sufficient volume of steam at a pressure in the range from 2 to 10 bars and a temperature of between 115° C. and 180° C. into said aqueous polymer dispersion at one or more points below the liquid level of said aqueous polymer dispersion within a zone of between one-quarter and three-quarters of the toal height of said aqueous polymer dispersion, through a static mixing device, mechanical mixing device or dynamic mixing device, while said gas space is maintained at subatmospheric pressures down to 0.5 bar, whereby from 5% to 50% by weight of the injected steam passes through said dispersion uncondensed, thereby substantially preventing formation of foam above said dispersion.

4,224,438

ADENOSINE-5'-CARBOXYLIC ACID AMIDES

Erich Fauland, Mannheim-Waldhof; Wolfgang Kampe, Heddesheim; Max Thiel, Mannheim; Karl Dietmann, Mannheim-Vogelstang, and Wolfgang Juhran, Mannheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

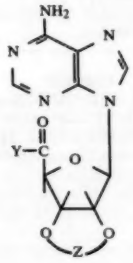
Filed Jul. 9, 1971, Ser. No. 161,338

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1970, 2034784; Jul. 14, 1970, 2034785

Int. Cl.[2] A61K *31/70*; **C07H** *19/18*

U.S. Cl. 536—26 **13 Claims**

1. Adenosine-5'-carboxylic acid derivatives of the general formula:



(I)

wherein

Z is two hydrogen atoms or a divalent lower alkylidene radical,

Y is —O—R, or

R is a phenyl lower alkyl radical, and

R_1 and R_2 are independently a hydrogen, hydroxyl, amino, lower alkyl, lower alkenyl, optionally N-alkylated lower aminoalkyl, cycloalkyl, hydroxyalkyl or a piperidyl radical, or

R_1 and R_2 taken together are a divalent alkylene radical containing 4—7 carbon atoms, or

R_1 and R_2 taken together with the nitrogen atom are a piperidyl, morpholinyl, piperazinyl or methylpiperazinyl radical, or a pharmacologically compatible salt thereof.

4,224,439

ACTIVATED MATRIX AND METHOD OF ACTIVATION

John S. Ayers; Geoffrey S. Bethell; William S. Hancock, all of Palmerston North, and Milton T. W. Hearn, Dunedin North, all of, assignors to Development Finance Corporation of New Zealand, Wellington, New Zealand

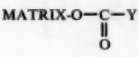
Filed Feb. 2, 1978, Ser. No. 874,628

Claims priority, application New Zealand, Feb. 8, 1977, 183283

Int. Cl.[2] C08B *3/00*

U.S. Cl. 536—32 **15 Claims**

1. A compound of the general formula III



III

wherein MATRIX is a water and organic solvent insoluble radical selected from the group consisting of: agarose, starch, dextran, cellulose, regenerated cellulose, hydroxy C_2–C_4 alkylated cellulose and hydroxy C_2–C_4 lower alkylated regenerated cellulose; and Y is a member selected from the group consisting of imidazoyl, 1,2,4-triazoyl and 1,2,3-benzotriazoyl.

4,224,440

1-(3,5-DISUBSTITUTED-2,4,6-TRIIODOPHENLY)-3-(POLYHYDROXY-ALKYL)UREA COMPOUNDS

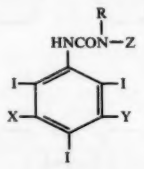
Kenneth R. Smith, Black Jack, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 577,850, May 15, 1975, Pat. No. 4,109,081. This application Jul. 3, 1978, Ser. No. 921,816

Int. Cl.[2] C07H *5/06*

U.S. Cl. 536—53 **4 Claims**

1. A compound of the formula:



wherein X and Y are each selected from the group consisting of lower alkoxy, hydroxy-(lower alkoxy), lower alkoxy-(lower alkoxy), lower acylamino, lower acylamino-(lower alkyl), lower acylamino-(lower acylamino), hydroxy-lower acylamino, N-(lower alkyl)-lower acylamino, N-hydroxy lower alkyl) lower acylamino, N-(polyhydroxy lower alkyl) lower acylamino, lower alkylsulfonamido, N-(lower alkyl)-lower alkylsulfonamido, 3,3-bis-(lower alkyl)-ureido, lower perfluoroacylamino, carbamyl, N-(lower alkyl)carbamyl,N-(hydroxy lower alkyl) carbamyl, N,N-di-(lower alkyl)carbamyl, N,N-di-(hydroxy lower alkyl)carbamyl, lower alkoxy-(lower acylamino), lower alkoxy-alkoxy-(lower acylamino), hydroxy and hydroxy-lower alkyl and

is the monovalent residue of a polyhydroxy-amine selected from the group consisting of N-(lower alkyl) aldosamines, ketosamines, N-(lower alkyl) ketosamines, N-(polyhydroxy-lower alkyl) amines, N-lower alkyl-N-(polyhydroxy-lower alkyl amines, deoxyaldosamines, lower alkyl-glycosidoamines, polyhydroxycarbocyclic amines and N-lower alkyl-(polyhydroxy-carbocyclic) amines in which N is a nitrogen atom, Z is a polyhydroxylic residue, and R is selected from the group consisting of hydrogen, lower alkyl, hydroxy-lower alkyl and

polyhydroxy-lower alkyl, said monovalent residue containing not more than 7 carbon atoms in its chain or ring.

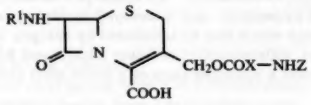
4,224,441

DERIVATIVES OF 7-AMINOCEPHALOSPORANIC ACID

Susumu Tsushima, Suita; Michiyuki Sendai, Osaka; Mitsuru Shiraishi, Suita, and Norichika Matsumoto, Neyagawa, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Division of Ser. No. 897,157, Apr. 17, 1978, Pat. No. 4,166,178, which is a continuation of Ser. No. 683,800, May 6, 1976, abandoned. This application Apr. 23, 1979, Ser. No. 32,692
Claims priority, application Japan, May 6, 1975, 50/55020; Jan. 1, 1976, 51/1275
Int. Cl.[2] C07D *501/18*
U.S. Cl. 544—16 **11 Claims**

1. A compound of the formula



wherein R^1 is hydrogen; X is a divalent group consisting of a carbon chain having 2 to 3 carbon atoms and a carbonyl or sulfonyl group at one terminal end thereof, said divalent group being unsubstituted or substituted on the carbon chain by a substituent selected from the group consisting of alkyl having up to 3 carbon atoms, benzyl, phenethyl, phenyl and tolyl, and, when two or more such substituents are present, they may form phenylene with the carbon chain; and Z is lower alkoxycarbonyl, acetyl, propionyl, benzoyl, chloroacetyl, lower alkylcarbamoyl, phenylsulfonyl or tosyl,

or a salt thereof.

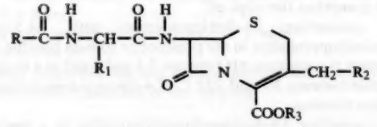
4,224,442

7-UREIDO ACETAMIDO SUBSTITUTED CEPHALOSPORIN ANTIBIOTICS

Robin D. G. Cooper, and David K. Herron, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

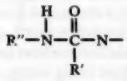
Continuation-in-part of Ser. No. 456,516, Apr. 1, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 553,062
Int. Cl.[2] C07D *501/56, 501/54;* A61K *31/545*
U.S. Cl. 544—27 **20 Claims**

1. The compound of the formula



wherein

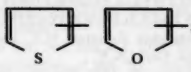
R is a 3-substituted ureido group represented by the formula



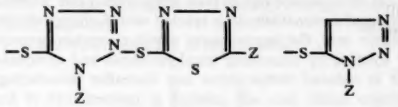
wherein R'' is hydrogen, C_1–C_3 alkyl, allyl, propargyl, C_3–C_6 cycloalkyl, phenyl, benzyl, or furfuryl;

R' is hydrogen or methyl;

R_1 is phenyl, mono or dihydroxyphenyl, mono or dihalophenyl, monohydroxy substituted mono or dihalophenyl, or

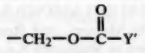


R_2 is acetoxy,



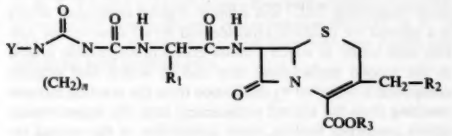
wherein Z is C_1–C_4 lower alkyl;

R_3 is hydrogen, indanyl, phthalidyl, or an acyloxymethyl group of the formula

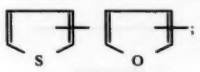


wherein Y' is C_1–C_4 alkyl or phenyl; and when R_3 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

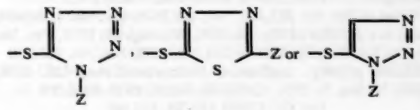
14. A compound of the formula



wherein Y is hydrogen, acetyl or methanesulfonyl; n is 2 or 3; R_1 is phenyl, mono or dihydroxyphenyl, mono or dihalophenyl, monohydroxy substituted mono or dihalophenyl, or

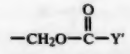


R_2 is



wherein Z is C_1–C_4 lower alkyl;

R_3 is hydrogen, indanyl, phthalidyl, or an acyloxymethyl group of the formula



wherein Y' is C_1–C_4 alkyl or phenyl; and when R_3 is hydrogen, the pharmaceutically acceptable non-toxic salts thereof.

4,224,443

CHEMICAL PROCESS FOR PREPARATION OF 7-CHLORO-2-METHYL-3,3A-DIHYDRO-2H,9H-ISOXAZOLO(3,2-b)(1,3)-BENZOXAZIN-9-ONE

Frank J. Stiefel, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Filed Dec. 29, 1978, Ser. No. 142

Int. Cl.[2] C07D *498/04*

U.S. Cl. 544—95 **3 Claims**

1. In the process for preparing 7-chloro-2-methyl-3,3a-dihydro-2H,9H-isoxazolo (3,2-b) (1,3) benzoxazin-9-one wherein a solution of crotonaldehyde is reacted with 5-chlorosalicylhydroxamic acid, the improvement which comprises preparing said solution by combining tetrahydrofuran and crotonaldehyde at reduced temperatures and thereafter introducing a hydrogen halide into said solution at temperatures of from about 15° to about 35° C.

4,224,444

PROCESS FOR THE PREPARATION OF CHLORO-BIS(ALKYLAMINO)-S-TRIAZINES

Luciano Baldi; Vittorio Messori, and Renato Francese, all of Turin, Italy, assignors to Rumianca S.p.A., Turin, Italy

Filed Oct. 1, 1979, Ser. No. 80,721

Int. Cl.[3] C07D *251/50*

U.S. Cl. 544—204 **12 Claims**

1. In a process for preparing chloro-bis (alkylamino)-s-triazine of high characteristics of handling and formulability by means of the step-wise replacement of two chlorine atoms of cyanuric chloride with alkylamino groups in an alkaline medium comprising water and a liquid organic compound which is a solvent for cyanuric chloride and forms a two-phase system with water, in which a molar excess of alkylamine is used in the second replacement step and in which said organic compound is removed by distillation from the reaction mixture resulting from the second replacement step, the improvement which comprises feeding, upon completion of the second replacement step, said reaction mixture from its aqueous phase and admixing the residual suspension or solution of chloro-bis (alkylamino)-s-triazine in the organic compound thus obtained, prior to, or during the distillation of the organic compound, with water added in a volumetric quantity of from 30 to 150% with respect to that of said aqueous phase.

4,224,445

THIENOTHIAZINE DERIVATIVES

Otto Hromatka; Dieter Binder, both of Vienna, Austria; Rudolf Pfister, Basel, and Paul Zeller, Allschwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

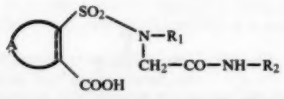
Division of Ser. No. 852,385, Nov. 17, 1978, Pat. No. 4,134,898, which is a division of Ser. No. 606,563, Aug. 21, 1975, Pat. No. 4,076,709. This application Oct. 30, 1978, Ser. No. 955,568

Claims priority, application Switzerland, Aug. 26, 1974, 11582/74; Sep. 9, 1974, 12157/74; Jul. 9, 1975, 8963/75

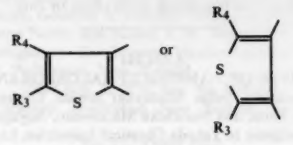
Int. Cl.[3] C07D *333/38, 333/40*

U.S. Cl. 544—212 **1 Claim**

1. A reactive functional derivative of an acid of the formula



wherein A together with the two carbon atoms to which it is attached forms the group



(a) (b)

and the broken line represents the double bond present in group (a); R_1 represents a lower alkyl group; R_2 is selected from the group consisting of 2-thiazolyl, 4-methyl-2-thiazolyl, 4,5-dimethyl-2-thiazolyl, 5-methyl-1,3,4-thiadiazolyl, 2-pyrazinyl, 2-pyrimidinyl, 1,2,4-triazin-3-yl, 2-pyridyl, 3-pyridyl, 4-pyridyl, 3-methyl-2-pyridyl, 4-methyl-2-pyridyl, 5-methyl-2-pyridyl, 6-methyl-2-pyridyl, 4,6-dimethyl-2-pyridyl, 5-isoxazolyl, 5-methyl-3-isoxazolyl, 3,4-dimethyl-5-isoxazolyl, 2,6-dimethyl-4-pyrimidinyl and 6-methyl-2-pyridyl group or a phenyl group which may be substituted by halogen, hydroxy, lower alkyl, trifluoromethyl or lower alkoxy; and R_3 and R_4 each represent a hydrogen atom or a lower alkyl group.

4,224,446

PROCESS FOR THE PRODUCTION OF METHOTREXATE

Enrico Catalucci, Arona, Italy, assignor to Lonza Ltd., Basel, Switzerland

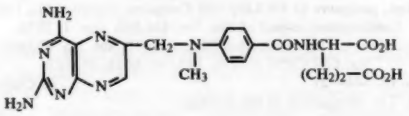
Filed Jul. 19, 1978, Ser. No. 926,009

Claims priority, application Switzerland, Aug. 12, 1977, 9894/77

Int. Cl.[2] A61K *31/495*; C07D *487/04*

U.S. Cl. 544—257 **14 Claims**

1. The process for the production of methotrexate, which is N[p-([2,4-diamino-6-pteridyl)-methyl]-N^{10}-methylamino)-benzoyl]-L-glutamic acid and which has the formula:



which comprises the steps of:

(a) converting 1,1-dichloroacetone with 2,4,5,6-tetraaminopyrimidine in the presence of sodium bisulfite and water at a constant pH between 3.5 and 5 and at a temperature between 10° and 100° C., 2,4-diamino-6-methylpteridine forming;

(b) converting 2,4-diamino-6-methylpteridine in a reaction medium with bromine, the reaction medium being water, 60 percent hydrogen bromide, glacial acetic acid or trifluoroacetic acid, 0.3 to 1.0 ml of bromine being used per 1.0 g of the 2,4-diamino-6-methylpteridine, 2,4-diamino-6-bromo-methyl pteridine forming; and

(c) converting the 2,4-diamino-6-bromo-methyl pteridine with p-(N-methyl)-aminobenzoyl-L-glutamic acid or a salt thereof in a polar reaction medium into methoxtrexate, the polar reaction medium being water, dimethyl formamide, dimethyl acetamide, dimethyl sulfoxide, ethanol, diethyl sulfoxide, ethyleneglycoldialkylether, formamide, methyl propionamide, sulfolane, N-methyl formamide, dimethyl sulfone, tetramethylsulfone, hexamethyl phosphoric acid triamide and a mixture of at least two of such polar reaction media.

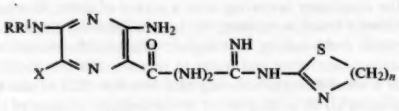
4,224,447

NOVEL PYRAZINECARBOXAMIDES AND PROCESSES FOR PREPARING SAME

Otto W. Woltersdorf, Jr., Chalfont, and Susan J. deSolms, Norristown, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 27, 1979, Ser. No. 24,294
Int. Cl.[2] C07D *417/12*
U.S. Cl. 544—405 6 Claims

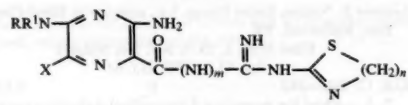
1. A compound of the formula:



wherein

R and R^1 are hydrogen
lower alkyl having from 1 to 5 carbon atoms,
cycloalkyl having from 3 to 6 carbon atoms,
lower alkenyl having from 2 to 5 carbon atoms;
lower alkynyl having from 2 to 5 carbon atoms, or
aralkyl wherein the alkyl group has 1 to 3 carbon atoms;
X is halo;
n is an integer selected from 2 or 3.

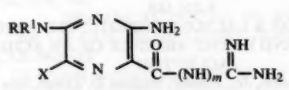
4. A process for preparing compounds of the formula:



wherein

R and R^1 are hydrogen,
lower alkyl having from 1 to 5 carbon atoms,
cycloalkyl having from 3 to 6 carbon atoms,
lower alkenyl having from 2 to 5 carbon atoms;
lower alkynyl having from 2 to 5 carbon atoms, or
aralkyl wherein the alkyl group has 1 to 3 carbon atoms;
X is halo;
n is an integer selected from 2 or 3, and
m is 1 or 2

which comprises reacting a pyrazinoylguanidine or pyrazinecarboxamidoguanidine of the formula:



with a substituted isothiocyanate of the formula:

$X(CH_2)_nNCS$

wherein R, R^1, X, Y, n and m are as defined above followed by cyclization to produce the desired product.

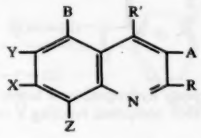
4,224,448

2'-(5'-NITROFURYL) SUBSTITUTED QUINOLINES

Raphael R. G. Haber, 42, Kaplansky St., Givatayim, Israel, and Eva Schoenberger, 38 Mivza Sinai St., Bat-Yam, Ramat Yosef, both of Israel

Continuation of Ser. No. 516,361, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 204,694, Dec. 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 643,830, Jun. 6, 1967, Pat. No. 4,087,427. This application Oct. 19, 1977, Ser. No. 909,401
Claims priority, application Israel, Jun. 23, 1966, 26022
Int. Cl.[2] A61K *31/47*; C07D *215/00*
U.S. Cl. 546—167 26 Claims

1. A nitrofuryl quinoline of the formula:



in which R is hydrogen, 5-nitrofuryl, lower alkyl, halo-substituted lower alkyl, lower alkanoyloxy-lower alkyl, lower alkoxy or hydroxy-lower alkyl; R' is hydrogen, 5-nitrofuryl or lower alkyl; X is hydrogen, halogen, hydroxy, lower alkoxy, or lower alkyl; Y is hydrogen or lower alkyl; Z is hydrogen, nitro, lower alkyl or lower alkoxy; A is hydrogen or lower alkyl; B is hydrogen, lower alkyl, nitro or lower alkoxy; or X and Y taken together complete a benzene nucleus; at least one of substituents R and R' being a 2-(5-nitrofuryl) group; wherein A, B, X, Y and Z are non-tertiary lower alkyl when adjacent to groups other than hydrogen; and when X is hydroxy, R, R', B and Z are not lower alkoxy; and their nitrogen oxides and non-toxic acid addition salts.

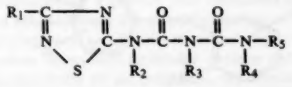
4,224,449

BIURET DERIVATIVES OF 3-TRIHALOMETHYL-1,2,4-THIADIAZOLES

John H. Tobin, Winsted; Walter A. Gay, Cheshire, and Lawrence E. Katz, Orange, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Aug. 8, 1979, Ser. No. 64,923
Int. Cl.[3] A01N *47/36*; C07D *285/08*
U.S. Cl. 548—128 10 Claims

1. A compound of the formula



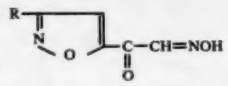
wherein R_1 is a CCl_3 or CF_3 group; R_2 and R_3, separately, are a hydrogen or a lower alkyl group of 1 to 4 carbon atoms or a phenyl group; and R_4 and R_5 are either hydrogen or a lower alkyl group of 1 to 4 carbon atoms or a phenyl group or a benzoyl group, with the proviso that either R_4 or R_5 or both, must be a hydrogen.

4,224,450
PROCESS FOR THE PREPARATION OF GLYOXAL-2-OXIMES

Takaji Honna; Motoaki Tanaka; Syozo Yamada, and Hidekazu Miyake, all of Tokushima, Japan, assignors to Taiho Pharmaceutical Company, Tokyo, Japan

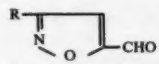
Division of Ser. No. 16,821, Mar. 2, 1979. This application Aug. 20, 1979, Ser. No. 67,888
Claims priority, application Japan, Mar. 9, 1978, 53-27300
Int. Cl.[2] C07D *261/14;* A61K *31/42*
U.S. Cl. 548—248 2 Claims

1. A process for the preparation of a glyoxal-2-oxim derivative represented by the formula,



[I]

wherein R represents hydrogen, or a lower alkyl of C_{1-4} or phenyl group, which comprises reacting a compound of



[II]

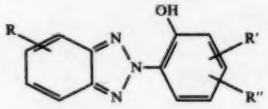
wherein R is defined as above, with nitromethane in the presence of an excess of a basic compound, at a temperature of −20° C. to 60° C.

4,224,451
PROCESS FOR THE PREPARATION OF 2-ARYL-2H-BENZOTRIAZOLES

Rex D. Roberts, Somerville, and William B. Hardy, Bound Brook, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

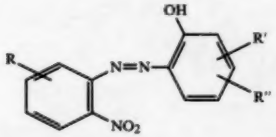
Filed Dec. 20, 1978, Ser. No. 971,621
Int. Cl.[2] C07D *249/20*
U.S. Cl. 548—260 10 Claims

1. An improved process for the preparation of 2-aryl-2H-benzotriazoles of the formula (I):



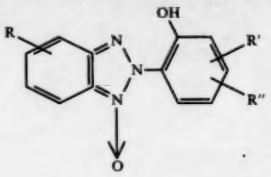
(I)

wherein R is hydrogen, alkyl having 1 to 8 carbon atoms, alkoxy having 1 to 8 carbon atoms, or halogen; R′ is hydrogen or alkyl having 1 to 8 carbon atoms and R″ is alkyl having 1 to 8 carbon atoms, with the proviso that at least one of R′ and R″ has at least 4 carbon atoms, by reduction, in a first stage, at a temperature of about 40° C. to 80° C., of the corresponding o-nitrophenyl azophenol of the formula (II):



(II)

which comprises combining an aqueous solution of an alkali metal or ammonium sulfhydrate or sulfide and a two-phase mixture of water and a solution of said (II) in an organic solvent selected from an aromatic solvent, aliphatic hydrocarbon solvent, or mixture of said solvents; said aqueous solution of sulfide or sulfhydrate, being used in an amount of from about 10 to about 50 percent in excess of that stoichiometrically required to convert said (II) to the corresponding benzotriazole N-oxide of the formula (III):



(III)

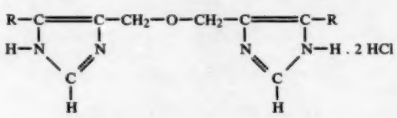
the combining occurring over a period of about 15 minutes to about 6 hours; separating the aqueous phase from the organic phase and washing the organic phase with a solution of a strong electrolyte and water to remove salts therefrom; then, in a second stage, reducing said N-oxide (III) to the benzotriazole (I) by adding water to the organic solution of (III) to form a two-phase reaction mixture at a temperature of about 50° C. to 75° C, adding thereto about 1 2 moles of zinc or tin per mole of said (III) and then adding, at a rate sufficient to maintain the reaction mixture in said temperature range, from about 1.5 to 2.5 moles per mole of (III) of an aqueous solution of an alkali metal hydroxide; then, adding sufficient strong inorganic acid to destroy excess zinc or tin and to neutralize the excess alkali metal hydroxide; filtering the insolubles therefrom; separating the organic phase from the aqueous phase and recovering said (I) from said organic phase.

4,224,452
METHOD FOR PREPARING 4-HYDROXYMETHYL IMIDAZOLES

Gunner E. Nelson, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Mar. 2, 1978, Ser. No. 882,801
Int. Cl.[2] C07D *233/64*
U.S. Cl. 548—342 4 Claims

2. A method for preparing 5-loweralkyl 4-(hydroxymethyl)-imidazole hydrochloride which comprises reacting a bis-(imidazolylmethyl)-ether compound of formula



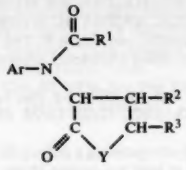
wherein R is the same alkyl group having from 1 to 4 carbon atoms with water at a pH of about 2.5 to about 3 and at an elevated temperature, using hydrochloric acid to effect said pH.

4,224,453
ACYLATION OF A LACTONE-SUBSTITUTED ANILINE COMPOUND IN THE ABSENCE OF AN ACID ACCEPTOR

Richard N. Reynolds, Jr., Albany; Stephen D. Ziman, San Francisco, and David C. K. Chan, Petaluma, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 847,504, Nov. 1, 1977, abandoned. This application Mar. 8, 1979, Ser. No. 18,489
Int. Cl.[2] C07D *333/24, 307/68, 307/12*
U.S. Cl. 549—63 12 Claims

1. A process for making a compound of the formula



wherein Ar is phenyl or phenyl substituted with the same or different substituents selected from 1 to 5 alkyl and/or alkoxy groups of 1 to 4 carbon atoms; 1 or 2 fluoro, chloro and/or bromo; and 1 nitro;

R^1 is alkyl, alkoxyalkyl or hydroxyalkyl of 1 to 4 carbon atoms unsubstituted or substituted with 1 to 4 fluoro, chloro or bromo; or

phenyl or benzyl unsubstituted or substituted with the same or different substituents selected from 1 to 4 alkyl groups of 1 to 4 carbon atoms; 1 to 4 alkoxy groups of 1 to 4 carbon atoms; 1 to 4 fluoro, chloro and bromo; and 1 nitro group;

R^2 is hydrogen or alkyl of 1 to 4 carbon atoms;

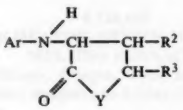
R^3 is hydrogen, alkyl of 1 to 4 carbon atoms, phenyl or phenyl substituted with 1 to 2 of the same or different substituents selected from fluoro, chloro, bromo and/or alkyl of 1 to 6 carbon atoms; and

Y is O or S;

which comprises:

contacting, in the absence of an added acid acceptor, an acyl halide of the formula

wherein X is fluoro, chloro or bromo and R^1 is as previously defined, with a compound of the formula



II

wherein Y, R^2 and R^3 are as previously defined and wherein the contacting is carried out in the presence of a non-basic organic solvent at a temperature between 65° and 150° C., and without any stoichiometric excess of formula II compound based on the mols of the acyl halide reactant, to thereby obtain a formula I compound.

4,224,454

PHOTOINITIATION SYSTEMS FOR FREE RADICAL POLYMERIZATION REACTIONS

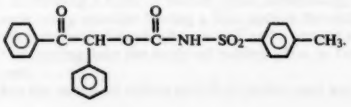
John R. McDowell, Erie; Dennis D. Howard, Girard, and Vincent J. Pascarella, Erie, all of Pa., assignors to Lord Corporation, Erie, Pa.

Filed Oct. 13, 1978, Ser. No. 950,970

Int. Cl.³ C07C *143/78, 125/065, 125/073, 125/077*

U.S. Cl. 560—12 **2 Claims**

1. An acyloin urethan compound having the structure



4,224,455

SULFONATED ALKOXYLATED ALKYL ARYLOL MALEATE REACTIVE SURFACTANTS

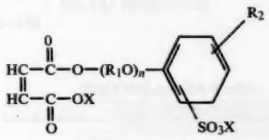
Julius H. Deutsch, Chicago, Ill., assignor to Stepan Chemical Company, Northfield, Ill.

Continuation-in-part of Ser. No. 831,176, Sep. 7, 1977, abandoned. This application Nov. 13, 1978, Ser. No. 959,419

Int. Cl.² C07C *69/60, 143/38*

U.S. Cl. 560—193 **6 Claims**

1. A reactive surfactant characterized by the formula



wherein

R_1 is selected from the group consisting of ethylene, propylene, and mixtures thereof,

R_2 is an alkyl group containing from 8 to 18 carbon atoms,

X is selected from the group consisting of hydrogen, alkali metals, lower alkanal amines, lower alkyl amines, and ammonium, and

n is a positive number of from about 2 to 50.

4,224,456

PROCESS FOR PREPARING ALIPHATIC MONOCARBOXYLIC ACID ESTER OF HYDROXYMETHYL-SUBSTITUTED MONOAROMATIC COMPOUND

Sumio Umemura; Kanenobu Matsui; Kunitoshi Koga, and Mineo Kuniyoshi, all of Ube, Japan, assignors to Ube Industries, Ltd., Yamaguchi, Japan

Filed May 23, 1978, Ser. No. 908,732

Claims priority, application Japan, May 30, 1977, 52-62159

Int. Cl.² C07C *67/05*

U.S. Cl. 560—241 **10 Claims**

1. A process for preparing an aliphatic carboxylic acid ester of a benzene compound having 1 to 2 hydroxymethyl substituents bound to the nucleus, which comprises the step of contacting, in a vapor phase, a gaseous feed comprised of a benzene compound selected from the group consisting of toluene and o-, m- and p-xylenes, an aliphatic monocarboxylic acid having 2 to 4 carbon atoms and molecular oxygen with a catalyst consisting essentially of (a) palladium, (b) arsenic and (c) at least one metal selected from the group consisting of alkali metals and alkali earth metals, the atomic ratio of palladium:arsenic:the alkali or alkali earth metal being 1:0.05–4:0.1–10, said arsenic ingredient being derived from at least one arsenic compound selected from the group consisting of arsenic acid, diarsenic pentoxide and alkali metal salts of arsenic acid.

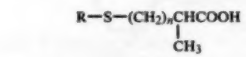
4,224,457

PROCESS FOR MANUFACTURING OPTICALLY ACTIVE SULFUR-CONTAINING CARBOXYLIC ACID

Jun-ichi Iwao, Hyogo; Masayuki Oya, Higashi; Eishin Kato, and Toshio Watanabe, both of Osaka, all of Japan, assignors to Santen Pharmaceutical Co., Ltd., Osaka, Japan

Filed May 4, 1979, Ser. No. 35,836
Claims priority, application Japan, May 18, 1978, 53/59678
Int. Cl.[3] C07B 19/00
U.S. Cl. 562—401 17 Claims

1. A process for manufacturing optically active sulfur-containing carboxylic acid which comprises reacting a racemic acid of the formula



[I]

wherein

n is 0 or 1;

R is hydrogen, benzoyl, acetyl or benzyl;

with an optically active amine selected from the group consisting of brucine, quinine, strychnine, quinidine, cinchonidine, cinchonine, (S)-(−)- or (R)-(+)-α-phenyl-ethylamine, (R)-(−)- or (S)-(+)-1,2-diphenylethylamine and dehydroabiethylamine to form the amine salt of said racemic acid in a resolution solvent, and fractionally crystallizing to separate the optically active isomers of said amine salts, and converting said optically active isomers of said amine salts to the optically active acid isomers.

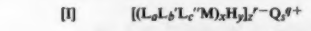
4,224,458

PROCESS FOR HOMOGENEOUS HYDROGENATION OF POLYCYCLIC AROMATIC HYDROCARBONS

Roger A. Grey, Denville, and Guido P. Pez, Boonton, both of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Jan. 31, 1979, Ser. No. 7,877
Int. Cl.[2] C07C 13/28, 15/24, 15/28
U.S. Cl. 585—266 19 Claims

1. A process for hydrogenating a polycyclic aromatic hydrocarbon, containing at least ten carbon atoms, comprising contacting a solution of a hydrogenation catalyst and said hydrocarbon, neat or in an inert solvent therefor, with an atmosphere containing hydrogen gas in the presence of a homogeneous hydrogenation catalyst, at a temperature of about 0° to 150° C., under a pressure of about 0 to 150 psig, said catalyst being a composition of the formula:



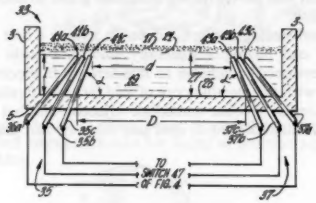
including dimers, trimers and tetramers thereof, wherein L, L′ and L″ are independently selected from organoligands containing phosphorus, arsenic or antimony elements, each ligand being free of carbonyl and containing at least one said element, M being a Group VIII metal, H being hydrido, Q being a cation, wherein a, b and c are integer values of 0 to 1, the sum of a, b, c being of from 1 to 3, x being a value of 1 or 2, y being an integer value of from 1 to 3x, x being defined as above, r and s independently being integer values of 1 or 2, and z and q independently being integer values from 1 to 3, wherein said composition is electrically neutral and contains a minimum of one and a maximum of three atoms of phosphorus, arsenic, antimony, or mixtures thereof, per Group VIII metal atom; thereby producing a partially hydrogenated product of said hydrocarbon.

4,224,459

ELECTRIC MELT FURNACE-ELECTRODES INCLINED TOWARD EACH OTHER TO VARY THE FIRING PATH DURING STEADY STATE OPERATION AND TO CREATE HOT SPOTS AFTER HEAT LOSS OR DURING START-UP

M. Laird Froberg, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 30, 1978, Ser. No. 956,475
Int. Cl.[2] C03B 5/02
U.S. Cl. 13—6 5 Claims



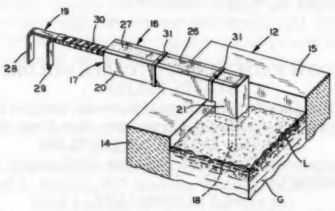
1. An electric furnace for resistive heating of molten glass by the Joule effect comprising:
a chamber for containing a body of said glass;
a first, second, and third electrode, each of said electrodes having a first end which is the base thereof and a second end which is opposite said first end;
means for mounting said first, second, and third electrodes in a spaced relationship in said chamber such that said base of said first electrode is spaced farther from said base of said third electrode than it is from said base of said second electrode, and at least one of said first and second electrodes is inclined toward the other so that the distance between said base ends of said first and second electrodes is greater than the distance between second ends of said first and second electrodes; and
means for selectively applying electrical power to said glass through said first and second electrodes and said first and third electrodes for heating said glass by the Joule effect.

4,224,460

ELECTRODE HEATING DEVICE FOR USE IN GLASS MELTING FURNACES

James W. Swillinger, Oregon, Ohio, and Thomas F. Stark, Littleton, Colo., assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Jan. 5, 1979, Ser. No. 1,356
Int. Cl.[3] C03B 5/02
U.S. Cl. 13—6 7 Claims



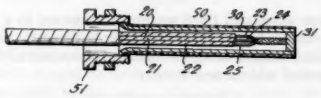
1. A heating device including an electrode for mounting from the top surface of a doghouse wall of a glass melting furnace containing a body of molten glass, comprising:
a. a supporting member having a first portion for sitting on the top surface of the doghouse wall and a second portion for extending into the body of molten glass in the doghouse;
b. a bus bar mounted within said first portion and extending from said second portion beyond the free end of said first portion for connection to a source of electrical energy;
c. said electrode being elongated and having an end mounted within said second portion, and an end extending therefrom for projecting into the body of molten glass; and
d. means operatively connecting said bus bar to the end of said electrode mounted within said supporting member.

4,224,461

UNGROUNDED THREE WIRE THERMOCOUPLE

Edmund W. Snyder, Jr., Ballston Spa, and Alexander J. Smolenski, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 18, 1978, Ser. No. 934,953
Int. Cl.[2] H01L 35/02
U.S. Cl. 136—233 11 Claims



1. A three wire thermocouple comprising in combination:
a pair of elongated insulated thermocouple wires;
a highly conductive insulated ground wire;
a hollow conductive cylinder adapted to be exposed to the medium to be monitored by said thermocouple;
one end of each of said pair of thermocouple wires and of said ground wire being disposed within and connected to one another and to said hollow conductive cylinder.

2. A temperature monitoring system including apparatus to be monitored; an instrumentation system having an electrical ground which is electrically isolated from the body of said apparatus; and a three wire thermocouple; said three wire thermocouple comprising, in combination:
a pair of elongated insulated thermocouple wires;
a highly conductive insulated ground wire;
a hollow conductive cylinder adapted to be exposed to the medium to be monitored by said thermocouple;
one end of each of said pair of thermocouple wires and of said ground wire being disposed within and connected to one another and to said hollow conductive cylinder;
said hollow conductive cylinder being mounted within said apparatus and being electrically insulated therefrom; said pair of thermocouple wires being connected to said instrumentation system; said ground wire being connected to said electrical ground of said instrumentation system.

4,224,462

HIGH VOLTAGE, ELECTRIC SUBMARINE CABLE WITH INSULATION OF LONGITUDINALLY VARYING VOLTAGE BREAKDOWN STRENGTH

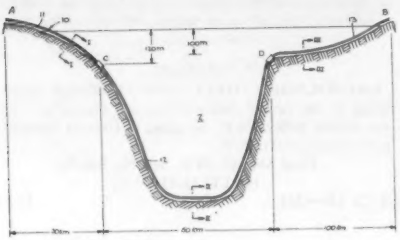
Elio Occhini, and Aldo Morello, both of Milan, Italy, assignors to Industrie Pirelli S.p.A., Milan, Italy

Filed Mar. 8, 1979, Ser. No. 18,766
Claims priority, application Italy, Mar. 21, 1978, 21391 A/78
Int. Cl.[2] H02G 9/02; H01B 7/14, 9/06
U.S. Cl. 174—37 12 Claims

1. A submarine cable for transmitting electrical power at a selected high voltage, said cable comprising:
a first section of cable with a conductor surrounded by insulation adequate to withstand and operate at said voltage when subjected to a relatively low hydrostatic pressure;
a second section of cable with a conductor surrounded by insulation adequate to withstand and operate at said voltage when subjected to a hydrostatic pressure higher than said relatively low hydrostatic pressure but inadequate for operation at said voltage when subjected to a lower hy-

drostatic pressure, said second section being electrically connected at one end to said first section; and

a third section of cable with a conductor surrounded by insulation adequate to withstand and operate at said voltage when said third section is subjected to a hydrostatic pressure lower than said higher hydrostatic pressure, said third section being electrically connected to the opposite end of said second section.



4,224,463

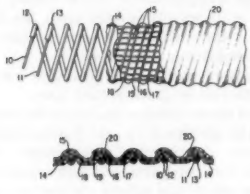
DUAL WIRE HOSE

Marvin A. Koerber, Abbeville, and Thomas A. Kutnyak, Greenwood, both of S.C., assignors to Automation Industries, Inc., Greenwich, Conn.

Filed Nov. 9, 1978, Ser. No. 958,994

Int. Cl.³ A47L *9/24*; F16L *11/11*

U.S. Cl. 174—47 **6 Claims**



1. A helically fabricated flexible hose comprising

(a) first and second parallel helical wires disposed in double lead fashion with successive convolutions alternating,

(b) an inner plastic strip wrapped helically about said wires with forward and rearward edge portions of said inner plastic strip overlapping convolutions of the first of said wires, and

(c) an outer plastic strip wrapped helically about said inner plastic strip with forward and rearward edge portions of said outer plastic strip overlapping convolutions of the second of said wires and, with said inner plastic strip, forming a multiple-ply wall which is thicker over said wire convolutions than between them.

4,224,464

LIQUID TIGHT CONNECTOR

Edward D. Bunnell, Palm Harbor, and Thomas J. Sotolongo, Clearwater Beach, both of Fla., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 24, 1978, Ser. No. 954,373

Int. Cl.² F16L *5/02*

U.S. Cl. 174—65 R **5 Claims**

1. A preassembled liquid tight connector for attaching jacketed flexible metallic conduit to a panel comprising:

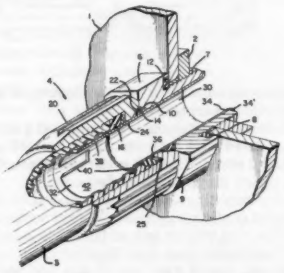
a body, said body having a passageway therethrough, a first end adapted for securing said body to said panel and a shoulder portion for abutting said panel, said shoulder further having a counterbore extending from said shoulder to said passageway,

a gland, said gland having a ridge which defines an aperture substantially equal in diameter to said passageway in said body, a complimentary counterbore extending from the external side of said ridge to said aperture, a cavity concentric with said aperture, said cavity extending from a conduit receiving side to said ridge and dimensioned to receive said jacketed conduit therein, and fastening means within said cavity for securing said gland to said jacketed conduit,

a ground sleeve, said ground sleeve having a first end, said first end having a generally smooth outside diameter dimensioned to achieve an interference fit electrical contact with the metallic core of said jacketed flexible metallic conduit, a collar immediate adjacent said first end, said collar dimensioned to abut said ridge of said gland and a second end immediately adjacent said collar, said second end having an outside diameter dimensioned to achieve electrical contact with said body defining said passageway and a length slightly greater than the combined length of said ridge and said body, and

a resilient O-Ring,

whereby a connector may be assembled by locating said sleeve in said gland such that said collar abuts said ridge and said second end protrudes through said aperture, said O-Ring is located around said second end prior to locating said body on said second end, said body being oriented on said second end such that said counterbore and said complimentary counterbore cooperate with said second end to surround said O-Ring whereupon said second end is flared against said body thereby drawing said gland toward said body and compressing said O-Ring into liquid tight contact with said second end, said counterbore and said complementary counterbore to form a preassembled liquid tight connector.



4,224,465

LABYRINTH PATH MULTIPLE CABLE HOLDER WITH STRAIN RELIEF

Hugo Ruzic, Leonberg, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 22, 1979, Ser. No. 23,056

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 7809938[U]

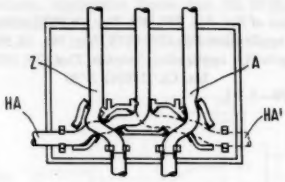
Int. Cl.³ H01R *13/58*

U.S. Cl. 174—135 **1 Claim**

1. A multiple cable holder with a strain relief, for telephone substation sets and the like, having ribs arranged on alternate sides along a cable path on a supporting surface, comprising:

rib means arranged to form a labyrinth having a plurality of cable paths and passages, such that one vertical edge on each of the ends of at least three of said ribs projects into the cable path by forming an acute angle, and such that said ribs are arranged in two rows of which the upper row contains three, and of which the lower row contains two

passages, with two side-way passages, one being open on the left and the other being open on the right between said two rows; and ahead of said two lower and said two



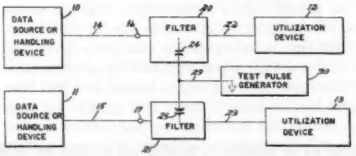
side-way passages there being arranged two oppositely directed engaging hooks for fixing in position a plurality of cables.

4,224,466

COMBINED DATA INPUT AND TEST CIRCUIT

Vincent N. Bush, Madison Lake, and Thomas K. Hiniker, Mankato, both of Minn., assignors to Hiniker Company, Mankato, Minn.

Filed May 10, 1979, Ser. No. 37,742
Int. Cl.[2] G01R *15/12*; H04L *25/02*
U.S. Cl. 178—69 G **7 Claims**



1. A combined data input and test circuit, comprising:

a plurality of input means adapted for connection to receive data pulses from sensors or other data handling or transmitting devices, for conveying said signals to a utilization device;

filter means including capacitance means connected for removing unwanted interference signals from said input means;

test pulse generating means selectively operative to produce test pulses; and

means for connecting said capacitance means to the output of said test pulse generating means so that test pulses generated thereby are coupled through the capacitance means to a utilization device and so that said unwanted interference signals are coupled to signal ground through the output of said test pulse generating means.

4,224,467

CORNER MOUNTED SOUND REPRODUCTION SPEAKER APPARATUS

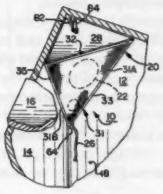
Andrew G. Lewis, 1090 Webster La., Des Plaines, Ill. 60016, and Bernard L. Kleinke, 853 Sanborn, Palatine, Ill. 60067

Filed Jun. 26, 1978, Ser. No. 919,347
Int. Cl.[2] H04R *1/02*; H05K *5/00*
U.S. Cl. 179—1 E **8 Claims**

1. In a corner mounted sound reproduction speaker apparatus, adapted to be connected electrically to a sound reproduction system and adapted to be mounted in a corner space defined in part by a pair of vertical surfaces intersecting at the corner space, the combination comprising:

a hollow enclosure housing having an imperforate generally triangular base and a pair of imperforate generally triangular side faces adapted to engage and to overlie the respective ones of the pair of vertical surfaces, said enclosure housing including inclined front face means of a generally triangular shape;

speaker means mounted within the interior of the enclosure housing behind said front face means and adapted to be connected electrically to and energized by the sound reproduction system to provide a range of response between about 20 cycles per second and about 20,000 cycles per second; and



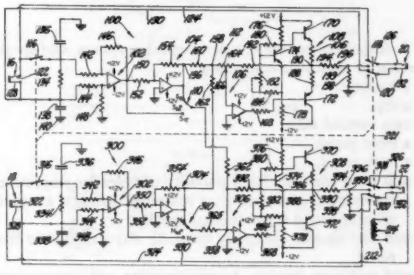
the plane of said base being disposed at an angle relative to a direction normal to said front face means, said angle being an angle in the range of between about 35° and about 50°, wherein said front face means includes a detachable perforate member removably attached to said side faces, one of said perforate member and said side faces having a plurality of rearwardly extending projections, the other one of said perforate member and said side faces having means defining a plurality of openings for receiving removably corresponding ones of said projections.

4,224,468

MASKING LEVEL DIFFERENCE ADAPTOR FOR AUDIOMETERS

Howard B. Calder, Jr., 2701 Hampshire Rd., Ann Arbor, Mich. 48104

Filed Oct. 5, 1978, Ser. No. 948,847
Int. Cl.[2] A61B *5/12*
U.S. Cl. 179—1 N **10 Claims**



1. An adaptor for audiometers to ascertain the masking level difference in a person's hearing, said audiometer having a signal voltage output and a noise voltage output, said adaptor comprising:

a signal channel having a channel input adapted to be connected with the signal voltage output of the audiometer, a signal channel mixer, and a signal channel output adapted to be connected with one earphone of a pair of earphones,

a noise channel having a channel input adapted to be connected with the noise voltage output of the audiometer, a noise channel mixer and a channel output adapted to be connected with the other earphone of the pair,

said channels including circuit means coupled with both of said channel inputs for applying the signal voltage and the noise voltage to the signal channel mixer and to the noise channel mixer,

said circuit means including a signal channel phase inverting means for selectively inverting the phase of the signal voltage at one of said mixers relative to the signal voltage at the other of said mixers and including a noise channel phase inverting means for selectively inverting the phase of the noise voltage at one of said mixers relative to noise voltage at the other of said mixers,

each of phase inverting means and each of said mixers including an amplifying device,

both of said channels having a voltage gain of unity between the respective channel input and output;

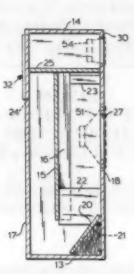
wherein the signal voltages at said channel outputs are substantially equal in amplitude to the signal voltage output of the audiometer and are selectively homophasically or antiphasically related to each other and the noise voltages at said channel outputs are substantially equal in amplitude to the noise voltage output of the audiometer and are selectively homophasically or antiphasically related to each other.

4,224,469

STEREO SPEAKER SYSTEM

Theodore R. Karson, 3857 N. Oketo Ave., Chicago, Ill. 60634

Filed Jan. 2, 1979, Ser. No. 128
Int. Cl.[2] H04R *1/02*
U.S. Cl. 179—1 E **6 Claims**



1. A speaker useable in a stereo speaker system, said speaker having an enclosure comprising:

a bottom;

a top;

two vertical sides;

a front panel;

a back panel;

said front panel having a plurality of holes for respectively receiving a bass speaker, a midrange speaker, a tweeter speaker, and a super-tweeter speaker;

said bass speaker generally centrally disposed in said front panel;

said midrange speaker, tweeter speaker and super-tweeter speaker disposed along a line in the shape of a crescent with said midrange speaker disposed at a top of said crescent shaped line nearest said top of said speaker enclosure, and said super-tweeter speaker disposed at a bottom of said crescent shaped line nearest a vertical side and said bass speaker, and said tweeter speaker disposed on said crescent shaped line between said midrange speaker and said super-tweeter speaker;

a non-resonant cavity inside said enclosure having a wall in which said bass speaker is mounted and which is of sufficient length to substantially prevent resonance of audio signals produced by said bass speaker, at least a portion of said non-resonant cavity having a trapezoidal cross-sectional shape in a plane parallel to said bottom; and

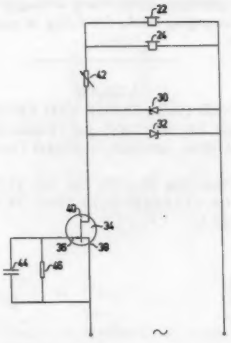
a tuning means connected to said enclosure for connecting said bass non-resonant cavity with the exterior of said enclosure.

4,224,470

HEADSET WITH LIMITER CIRCUIT

Leif A. T. Persson, Ragnvallagatan 22 A, 252 62 Helsingborg, and Tord P. Lundin, 260 5 Rosengatan 5, Billesholm, both of Sweden

Continuation of Ser. No. 856,909, Dec. 2, 1977, abandoned. This application Feb. 26, 1979, Ser. No. 15,359
Claims priority, application Sweden, Dec. 22, 1976, 7614482
Int. Cl.[2] H03G *3/30*
U.S. Cl. 179—1 VL **4 Claims**



1. A battery-free protective hearing aid headset for protecting the ears of the wearer from acoustical sound originating externally of the headset, and for receiving and converting into sound audible to the ears of the wearer, electronic signals from a source, such as a microphone, positioned remote from the headset, comprising

two ear-pad casings,

an electrically operated earphone mounted in each casing for converting electronic signals to sound, and

means for operating said earphones including a flexible cord operatively connected at one end to said earphones and adapted to be connected at its opposite end to an external electronic signal source for supplying audio electrical signals to said earphones, each of said earphones being operable by said electrical signals without use of any separate voltage supply,

said means further including a limiter circuit in one of said casings and connected between said signal source and said earphones to limit the sound level from the earphones to a value harmless to the wearer's hearing, and to limit the magnitudes of the signals applied to said earphones to values harmless to said earphones, and said limiter circuit being directly responsive to the signals from said source and comprising

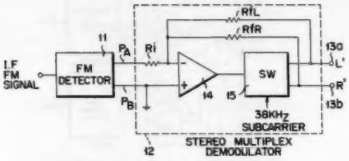
a first stage connected in parallel across the earphones and operative to limit the voltage applied to said earphones, and

a second stage connected in series with said earphones and operative to limit the current flow therethrough, wherein said first stage comprises a pair of Zener diodes mounted in parallel and in opposed directions to each other, and connected in parallel with said earphones, and said second stage comprises a field-effect transistor having its collector-emitter circuit in series with said earphones.

4,224,471
FM RADIO RECEIVER

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 5, 1979, Ser. No. 27,272
Claims priority, application Japan, Apr. 12, 1978, 53/42792; May 31, 1978, 53/66096
Int. Cl.[2] H04H *5/00*
U.S. Cl. 179—1 GD 10 Claims



1. An FM radio receiver comprising:

an RM detector circuit connected to receive an incoming FM signal for recovering a stereo composite signal containing multiplexed left and right audio signal components and a pilot signal therefrom, said FM detector circuit having first and second terminals between which the recovered stereo composite signal appears and said second terminal being supplied with a predetermined DC potential so that said first terminal has the predetermined DC potential;

a stereo multiplex demodulator circuit having an input terminal and first and second output terminals for converting the stereo composite signal applied to said input terminal into separate left and right audio signals which appear to said first and second output terminals respectively;

means for causing said input terminal of said demodulator circuit to have the predetermined DC potential; and

coupling means for directly coupling said first terminal of said FM detector circuit to said input terminal of said stereo multiplex demodulator circuit.

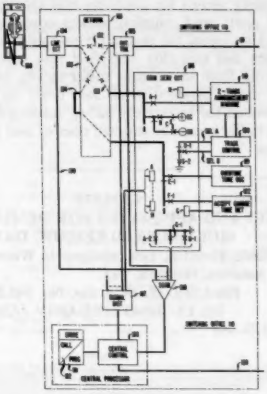
4,224,472
METHOD AND APPARATUS FOR APPORTIONING CALL CHARGES

Alfred Zarount, Middletown, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jul. 16, 1979, Ser. No. 57,714
Int. Cl.[3] H04M *15/08*
U.S. Cl. 179—7.1 R 11 Claims

1. An arrangement for apportioning charges on coin calls originating from a coin station and terminating at a called station wherein control means associated with the coin station applies an alerting signal to the established coin connection and wherein register means are provided for accumulating call billing data for calls served by said control means characterized by

means associated with said called station and responsive to said alerting signal for transmitting an acceptance signal to said control means and said control means includes means responsive to said acceptance signal for actuating said

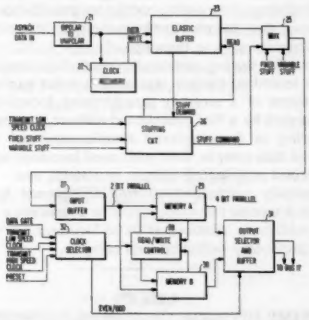


register means to record a portion of the charges for said coin call for billing said called station.

4,224,473
TDMA MULTIPLEXER-DEMULTIPLEXER WITH MULTIPLE PORTS

Pradman Kaul, Gaithersburg; Ova G. Gabbard, Germantown; Deepak Muzumdar, Gaithersburg, and Anders Eklof, Poolesville, all of Md., assignors to Digital Communications Corporation, Gaithersburg, Md.

Filed May 31, 1978, Ser. No. 911,250
Int. Cl.[2] H04J *3/06*
U.S. Cl. 370—84 12 Claims



1. An asynchronous TDMA multiplexer with plural input ports for receiving plural asynchronous bit streams and for, on command, producing a continuous high rate bit stream consisting of sequential continuous high rate bit stream portions from a plurality of said ports, in which each of said plural input ports includes:

elastic buffer means for writing therein in response to data received at said port, at a rate equal to the rate of receipt of said data,

means for reading data from said elastic buffer means substantially synchronously and simultaneously, and at a first rate at all said ports,

a compression buffer means for writing therein data read from said elastic buffer means and means for reading data from said compression buffer means at said high rate,

and in which said multiplexer further includes a common control means including:

clock means for generating a clocking signal at said first rate and for generating a clocking signal at said high rate and coupling means for coupling said clocking signals to all said ports, said coupling means coupling said high rate clocking signal for readout from said compression buffer means and coupling said first rate clocking signal for readout from said elastic buffer means, and

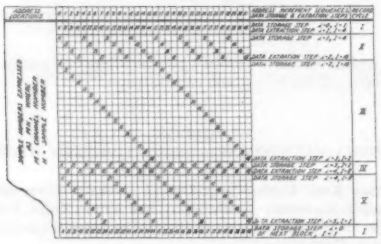
gating means coupled to all said ports for producing said command for selectively gating reading of said compression buffer means at selected ones of said ports at selected times.

4,224,474

METHOD AND APPARATUS FOR DEMULTIPLEXING MULTIPLEXED SEISMIC DATA

Carl H. Savit, Houston, Tex., assignor to Western Geophysical Co. of America, Houston, Tex.

Filed Sep. 28, 1978, Ser. No. 946,898
Int. Cl.[2] H04J *3/02*; G01V *1/24*
U.S. Cl. 370—68 **19 Claims**



1. An improved method of seismic exploration wherein seismic signals are received in a plurality of data channels, said signals in said data channels being repeatedly sequentially sampled during a recording cycle to provide an output of multiplexed data samples in channel-sequential order by sample number, comprising the steps of:

sequentially storing said multiplexed data samples from a first recording cycle in consecutive order into addressable locations of a memory at addressed locations that are separated by a first preselected address increment;

extracting in demultiplexed sample-sequential order said stored data samples from addressed locations separated by a second preselected address increment; and

substantially concurrently storing multiplexed data samples from a second recording cycle in consecutive order into the addressed locations as those locations are vacated by the previously extracted data samples.

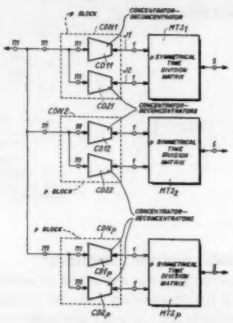
4,224,475

TIME DIVISION SWITCHING NETWORK

Pierre Charransol; Claude Athenes, and Jacques Sallé, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jan. 17, 1979, Ser. No. 4,237
Claims priority, application France, Jan. 20, 1978, 78 01634
Int. Cl.[2] H04Q *11/04*
U.S. Cl. 370—59 **10 Claims**

1. A time division switching network for switching binary samples of (a) binary elements from input junctions to output junctions, including a plurality of terminal stage modules, a modular terminal stage and a central stage that permits the interconnection of different terminal stage modules, (m) input junctions and (m) output junctions each of said terminal stage modules including (p) block (p being superior or equal to two) arranged in groups, each group comprising one block of two digital concentrators-deconcentrators and one symmetrical time division matrix having (a) inputs and (a) outputs, the (m) input junctions of said module being multipled on the inputs of all the digital concentrators-deconcentrators, and the (m) output junctions of said module being multipled on the outputs of all said digital concentrator-deconcentrators, each of said two digital concentrator-deconcentrators of the group having one



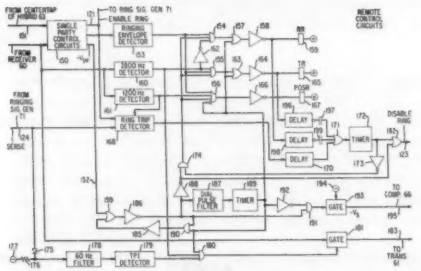
input and one output connected, respectively, to one output and one input of the symmetrical time division matrix, a generator of audible tones and messages, said symmetrical time division matrix having one input connected to said generator of audible tones and messages and (a-3) remaining inputs and (a-3) outputs connected to said central stage.

4,224,476

MULTIPARTY SUBSCRIBER LOOP CARRIER SYSTEMS

Frank P. Tuhy, Jr., Montville, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,389
Int. Cl.[3] H04J *1/14*
U.S. Cl. 179—17 E **3 Claims**



3. A multiparty ringing system for carrier-derived telephone subscriber loops characterized by

a source of three supervisory tones,

means utilizing a first one of said tones for providing single party ringing supervision,

means utilizing two of said tones for providing two-party ringing supervision,

means utilizing all three of said tones for providing four-party fully selective and eight-party semiselective ringing supervision,

means at the remote end of said carrier-derived telephone subscriber loop for detecting a balanced ground connection, and

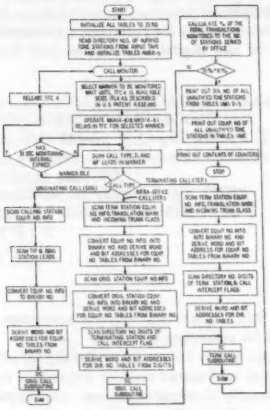
means responsive to said detecting means for returning one of said signaling tones from said remote end.

4,224,477

ARRANGEMENT FOR TRANSLATING TELEPHONE STATION EQUIPMENT NUMBERS INTO DIRECTORY NUMBERS

William B. Perkinson, Colts Neck, N.J., and Ray K. Zies, Reynoldsburg, Ohio, assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 11, 1978, Ser. No. 941,267
Int. Cl.[2] H04Q 3/47, 3/70
U.S. Cl. 179—18 ET 9 Claims



1. In a telephone office serving a plurality of telephone stations in which each station is associated with an equipment number generated by the office and a directory number, a method of translating a plurality of equipment numbers of prescribed ones of the stations into their associated directory numbers, CHARACTERIZED BY the steps of

scanning terminating calls in the office directed to said stations to obtain the equipment numbers of the terminating stations and the associated directory numbers,

comparing the equipment numbers obtained during the scanning of terminating calls to the equipment numbers of said prescribed ones of the stations, and

associating ones of the directory numbers obtained during scanning of the terminating calls with ones of the prescribed stations whose equipment numbers match the equipment numbers obtained during scanning of the terminating calls.

4,224,478

DATA TRANSMISSION CIRCUIT FOR ESTABLISHING A BIDIRECTIONAL DATA PATH IN A TELEPHONE SYSTEM

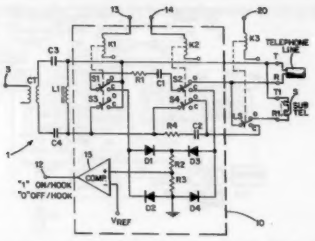
Robert J. Fahey, Burlington, and Martin L. Resnick, Chestnut Hill, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn. and GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 4, 1978, Ser. No. 965,808
Int. Cl.[2] H04M 3/22
U.S. Cl. 179—18 FA 15 Claims

1. A data transmission circuit for establishing a data transmission path between a first terminal and tip and ring terminals of a telephone system, said telephone system including a telephone line connected with the tip and ring terminals and a telephone coupled across the tip and ring terminals and to the telephone line, said tip and ring terminals having a voltage thereacross of a value corresponding to the on/hook condition or off/hook condition of the telephone, said data transmission circuit comprising:

status monitor circuit means operative to examine on a frequent basis the voltage across the tip and ring terminals and to produce an output signal when the voltage across the tip and ring terminals has a value corresponding to an on/hook condition of the telephone;

first circuit means adapted when data is to be transmitted between the first terminal and the tip and ring terminals and following an output signal representative of an on/-hook condition being produced by the status monitor circuit means to uncouple the telephone from across the tip and ring terminals and to establish a continuous dc loop between the tip and ring terminals to the telephone line



and to thereafter make and break the dc loop in accordance with a predetermined telephone number;

second circuit means operative upon termination of the making and breaking of the continuous dc loop by the first circuit means to maintain the continuous dc loop between the tip and ring terminals; and

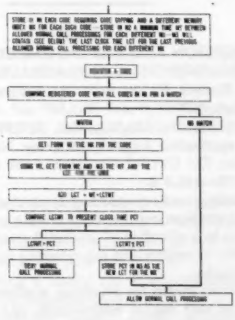
third circuit means operative after the making and breaking of the continous dc loop to establish an ac data path between the first terminal and the tip and ring terminals for the transmission of data between the first terminal and the tip and ring terminals.

4,224,479

METHOD OF CONTROLLING CALL TRAFFIC IN A COMMUNICATION SWITCHING SYSTEM

Kenneth E. Crawford, Columbus, Ohio, assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 21, 1979, Ser. No. 13,386
Int. Cl.[2] H04M 15/02
U.S. Cl. 179—18 DA 11 Claims



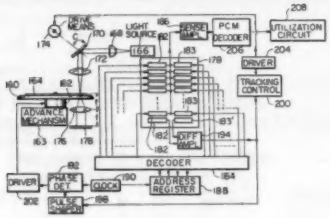
1. A method of controlling call traffic in a communication switching system wherein attempts are made to complete at least parts of communication paths for calls CHARACTERIZED BY limiting the recurrence rate of successive attempts for a particular type of call to a maximum rate prescribed by a parameter of the particular type of call.

4,224,480

HOLOGRAPHIC PLAYBACK SYSTEM USING A CHARGE STORAGE SENSOR AND BINARY DECODING

Isao Satoh, and Makoto Kato, both of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Division of Ser. No. 768,744, Feb. 15, 1977, Pat. No. 4,104,489.
This application Feb. 8, 1978, Ser. No. 876,130
Claims priority, application Japan, Feb. 18, 1976, 51-17294
Int. Cl.[2] G11B *7/12, 17/00*
U.S. Cl. 179—100.3 G **4 Claims**



1. A playback system for reproducing an original signal from a disk record containing a series of holograms recorded along convoluted tracks, wherein each of said holograms represents a pattern of data bits and a synchronization bit, comprising:

a turntable adapted to support said record disk;

an optical system for directing a laser beam to said record disk, whereby the laser beam is diffracted by the interference fringes of said hologram to reconstruct the image of said pattern of data and synchronization bits;

means for driving said turntable so that said holograms are successively shifted in location with respect to said laser beam and illuminated by said beam;

a solid-state image sensor having a plurality of charge storage type sensing elements each positioned to receive the reconstructed image of each data bit, and a non-charge storage type sensing element positioned to receive the reconstructed image of said synchronization bit;

means for triggering said charge storage type sensing elements sequentially to generate a series of binary signals before a subsequent hologram is shifted to the beam-illuminated position;

means for decoding said binary signals into said original signal; and

means for controlling the speed of said turntable in accordance with said synchronization signal.

4,224,481

COMPRESSION AND EXPANSION CIRCUITRY FOR A RECORDING AND PLAYBACK SYSTEM

James T. Russell, Richland, Wash., assignor to Eli S. Jacobs, New York, N.Y.

Division of Ser. No. 556,780, Mar. 10, 1975, abandoned. This application Aug. 16, 1978, Ser. No. 934,210
Int. Cl.[2] G11B *7/00;* **H04N** *5/86;* **G11C** *7/00*
U.S. Cl. 179—100.3 B **15 Claims**

1. Recording and reproducing apparatus comprising:

a record medium capable of receiving and recording information in a plurality of separated tracks,

means for recording and reproducing digital information in said tracks,

input circuit means for receiving a substantially continuous flow of said digital information, and for separating the same into compressed segments corresponding to said tracks for recording the same, said input circuit means comprising a first in first out memory for receiving a continuous flow of digital information, an up-down counter for registering full and empty conditions of said memory, a clock signal generator, and circuit means responsive to said full and empty conditions for controlling the clock generator signal to withdraw information from said memory for recording said information when said memory is full and emptying the memory during the period of a desired information track,

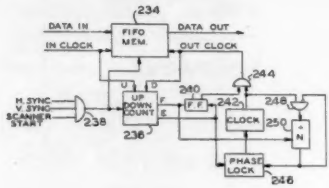
and output circuit means for reading out the digital information from said tracks and for expanding the same into a substantially continuous stream.

3. Recording and reproducing apparatus comprising:

a record medium capable of receiving and recording information in a plurality of separated tracks,

means for recording and reproducing digital information in said tracks,

input circuit means for receiving a substantially continuous flow of said digital information, and for separating the same into compressed segments corresponding to said tracks for recording the same,



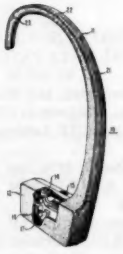
and output means for receiving the digital information read out from said tracks and for expanding the same into a substantially continuous stream, said output means comprising a first in first out memory for receiving digital information being read out, an up-down counter for registering the full condition of said memory, and circuit means responsive to the conditions of the last mentioned up-down counter for controlling readout so that said memory fills during reading of an information track and may be continuously read out at a predetermined lower readout rate.

4,224,482

MOBILE MICROPHONE-TRANSMITTER ASSEMBLY

Gregory Lese, Long Branch; Charles F. Liebler, Piscataway, and Dilipkumar B. Patel, Ocean, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 30, 1978, Ser. No. 965,076
Int. Cl.[2] H04M *1/05*
U.S. Cl. 179—157 **2 Claims**



1. A mobile microphone-transmitter assembly comprising

mechanical means with a hook-like portion to be worn around the neck of a user and a pod-like portion which rests against the front of the body of a user,

a first plurality of light emitting devices located on said hook-like portion so as to radiate generally to the rear of said user,

a second plurality of light emitting devices located on said pod-like portion so as to radiate generally to the front of said user,

a microphone mounted on said pod-like portion, means within said pod-like portion for energizing said first and second pluralities of light emitting devices, and

means responsive to sound energy incident on said microphone for controlling the light intensity of both pluralities of said light emitting devices accordingly,

said first and second plurality of light emitting devices providing a substantially omnidirectional, horizontal infrared radiation pattern.

4,224,483

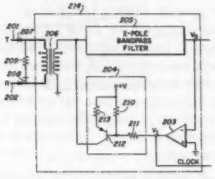
ELECTRONIC LOADED/NONLOADED TELEPHONE LOOP IDENTIFICATION CIRCUIT

James L. Neigh, Fair Haven, N.J., and Richard G. Sparber, Wheaton, Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 12, 1979, Ser. No. 19,368

Int. Cl.[2] H04M *3/22*; G01R *27/00*

U.S. Cl. 179—175.2 R **11 Claims**



1. A communications loop testing arrangement comprising an impedance measuring means (**214**) for measuring the impedance of a connected load;

characterized in that

said impedance measuring means is adapted to generate an impedance signal having an amplitude representative of the real part of the impedance of said connected load, and said loop testing arrangement further comprises a reference signal source (**304**) for providing a reference signal having a reference amplitude and comparator means (**320**) for comparing said impedance signal to said reference signal and for generating an output signal, whereby said output signal indicates a nonloaded loop if the real part of the impedance of a connected loop is less than a reference value and indicates a loaded loop if the real part of the impedance of a connected loop is greater than the reference value.

4,224,484

TIME SWITCHING DEVICE

Wolfgang Haas, and Peter Schonhardt, both of St. Georgen, Fed. Rep. of Germany, assignors to Dieter Graesslin Feinwerktechnik, Fed. Rep. of Germany

Filed Jun. 5, 1978, Ser. No. 912,854

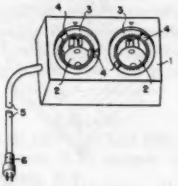
Claims priority, application Fed. Rep. of Germany, Jun. 4, 1977, 2725397

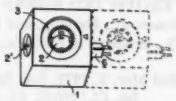
Int. Cl.[2] H01H *43/10*

U.S. Cl. 200—38 FB **2 Claims**

1. A time switching device for controlling dependent devices by switching an electrical connection comprising:

a housing assembly, at least two time switching assemblies carried by said housing, each of said time switching assemblies having an operatively associated electrical output connector controlled by a time switch of each of said time switching assemblies, programmable controls for each assembly, the individual components of each of the time switching assemblies being spatially positioned adjacent to one another with in said housing, a single electrical input connector to said housing providing power to both of said output connectors under control of said time switches, the output connectors being plug sockets, the time switch assemblies including time dials, the time dials enclosing the plug sockets in ring form around said plug sockets, the time dials being rotatable with respect to the plug sockets, the time dials controlling on-off actuation of switches of the associated socket, the time dials being programmable to open and close each switch of the associated time switch assembly, said time dials being viewable from a top





surface of said housing assembly, having spaced top and bottom surfaces, the plug sockets being accessible through the top surface, the top surface having openings therethrough exposing the plug sockets, a time measuring element provided with in said housing, said time measuring element driving said time dials, the time switching assemblies being assembled together to form a single piece strip housing, the plug sockets being arranged in the top face perpendicular to a back face of the housing adjacent one another and electrically interconnected to a common electrical input.

4,224,485

TELEPHONE JACK

Charles L. Krumreich, Indianapolis, Ind., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation of Ser. No. 765,845, Feb. 4, 1977, now Defensive Publication No. T961,003. This application Oct. 16, 1978, Ser. No. 951,561

Int. Cl.[3] H01R *33/30*

U.S. Cl. 200—51.1 **14 Claims**

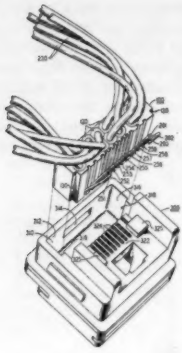
1. A telephone jack for selectively connecting and disconnecting telephone station equipment to a telephone line, the station equipment being connected to the jack by plugs complementary to the jack, the jack comprising:

a housing including a cavity for accommodating complementary plugs of different sizes;

a plurality of connector contact springs positioned within the cavity for engaging the contacts of the complementary plugs; and

a pair of switch contact springs, one of which is biased against the other contact spring, the biased contact spring being deflected away from the other contact spring responsive to the insertion within the cavity of a complementary plug of a first size, and the biased contact spring remaining in engagement with the other contact spring

upon the insertion in the opening of a complementary plug of a second size, the switch contact springs being respec-



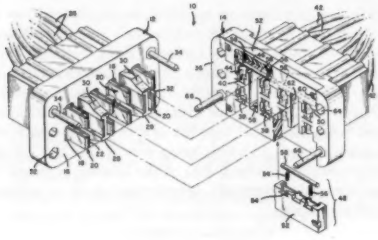
tively electrically connected in parallel with individual connector contact springs.

4,224,486

SHUNT PROTECTED POWER CONNECTOR

John A. Zimmerman, Jr., Hershey, and Larry L. Leitzel, Halifax, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 5, 1979, Ser. No. 17,630
Int. Cl.[3] H01R *33/30*
U.S. Cl. 200—51.1 10 Claims



1. A shunt protected power connector comprising:

a pair of mating plug and receptacle members,

said plug member having a housing of insulative material with a mating face, a plurality of terminal passages extending through said housing and opening onto said face, a like plurality of terminals each mounted in a respective one of said passages with one end extending at least part way from said face and the other end terminating a respective conductor, and at least one rigid projection extending normal to said face and having a profiled surface;

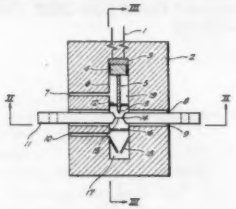
said receptacle member including a housing of insulative material having a mating face, a like plurality of terminal passages extending through said housing and opening on said face, each said passage in said receptacle housing being aligned with a respective passage in said plug housing, a like plurality of terminals each mounted within a respective one of said passages with one end adapted to mate with a respective terminal of said plug member and the other end terminating a respective conductor, shunt means extending transversely to and impinging upon each said terminal passage, said shunt means including at least one elongated first recess in said mating face adjacent to and opening on a row of passages; and auxiliary housing block mounted in each said elongated first recess; a groove in and extending the length of said auxiliary housing block and being directed towards said passages; at least one shunt bar lying in said groove; at least one blind bore in a base of said groove; spring means in each said blind bore acting against said shunt bar, and at least one second recess in said mating face each adapted to receive a respective one of said at least one projection of said plug member therein whereby the profiled surface of said projection engages said shunt bar upon partial mating of said members and lifts it out of engagement with said terminals upon substantially complete mating of said members.

4,224,487

FAST ACTING EXPLOSIVE CIRCUIT INTERRUPTER

Bent P. Simonsen, 27 Starfish Ct., Newport Beach, Calif. 92663

Filed Feb. 23, 1978, Ser. No. 880,700
Int. Cl.[2] H01H *39/00*
U.S. Cl. 200—61.08 6 Claims

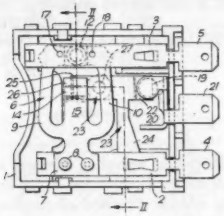


1. A high speed, high impedance, explosive circuit interrupter comprising a housing defining an internal cavity having side walls substantially parallel to the longitudinal axis of said cavity, at least two load-carrying conductors entering said cavity laterally from opposing sides and at opposing points therein spaced from either end of said cavity, said conductors being electrically conductively connected with each other within said cavity by a breakable high conductance filament, plunger-driven non-conductive cutting means slidably mounted along said longitudinal axis within said cavity and spaced from said filament toward a first end of said cavity for breaking said filament in traveling longitudinally from said first end of said cavity toward the other end thereof and for insulating said conductors from each other, said plunger having a lateral cross section conforming substantially to the lateral cross section of said cavity throughout the range of longitudinal travel thereof, for driving said cutting means through said filament upon detonation of the explosive element hereinafter defined and for isolating said filament from the gaseous products of explosion of said explosive element, an explodable element positioned within said cavity and between said plunger-driven cutting means and said first end of said cavity for forcing said cutting means along said longitudinal axis and through said filament upon detonation of said explosive element, said element having electrical terminals in electrical communication therewith for conducting a detonating signal from a signal generator to said explosive element, at least one venting means between said filament and said first end of said cavity for venting from said cavity gas compressed by either detonation of said explosive element or longitudinal travel of said cutting means upon detonation of said element and for attenuating the pressure increase around said filament during and after said detonation, and at least one venting means communicating between said cavity at a point therein spaced from said filament toward the other end of said cavity and the exterior of said cavity for venting from said cavity gas compressed within the portion of said cavity spaced from said filament toward the other end of said cavity.

4,224,488
ELECTRICAL SWITCH DEVICES

Guglielmo Rossi, Stutensee-Friedrichstal, Fed. Rep. of Germany, assignor to Ranco Incorporated, Columbus, Ohio

Filed Jul. 14, 1978, Ser. No. 924,662
Claims priority, application United Kingdom, Jul. 13, 1977, 29381/77
Int. Cl.[2] H01H 21/04
U.S. Cl. 200—67 A 8 Claims

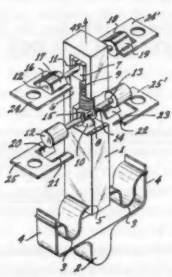


1. A snap acting switch device comprising a base, a fixed contact carried by a support member anchored to said base, a movable contact carried by a snap spring element, and an operating element acting upon the spring element, said support member being rigid but deformable, and comprising a terminal strip anchored to the base at two spaced apart positions between which the said strip is unsupported and deformable, said fixed contact carried by the said unsupported part of the terminal strip, and said unsupported part of the terminal strip having a predetermined deformation which determines the operating point of the switch contacts upon displacement of the operating element in the contact-opening direction.

4,224,489
SNAP ACTION SWITCH

Bernhard Dietrich, Eichenau, Fed. Rep. of Germany, assignor to Schaltbau Gesellschaft mbH, Munich, Fed. Rep. of Germany

Filed Nov. 17, 1978, Ser. No. 961,520
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1977, 2752638
Int. Cl.[3] H01H 1/18, 1/20, 5/00
U.S. Cl. 200—76 11 Claims



1. Snap action switch, comprising:

a spring-biased plunger movable in a first, longitudinal direction;

at least one contact carrier, extending laterally from the plunger in opposite directions and having two contacts respectively arranged on the carrier on opposite sides of the plunger and along an axis at right angles to said first direction, each contact having first and second surface portions respectively facing in different directions, these directions being located in a plane extending parallel to said first direction as well as to a direction at right angles to said first direction, said plane further extending at right angles to said carrier axis;

a plurality of stationary contacts arranged in pairs and including at least two pairs, the two pairs being respectively arranged adjacent to said two contacts with a total of four contacts arranged in a near-rectangle, the contacts of each pair being inclined to each other, defining a trough-like configuration respectively for concurrent engagement with one and the same of the contacts on said carrier, whereby the different directions, in which the said surface portions of the respective contact face, are oriented respectively at right angles to contact surfaces of the stationary contacts of the respective pair:

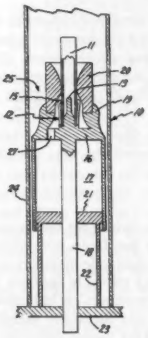
a convex calotte-shaped mount in the plunger; and

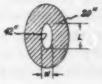
means for articulating the contact carrier on the calotte-shaped mount, for permitting the contact carrier to undergo a turning motion on an axis in said first direction.

4,224,490
FLUID BLAST CIRCUIT BREAKER

Gerhard Frind, Altamont, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 6, 1978, Ser. No. 958,041
Int. Cl.[2] H01H 33/70
U.S. Cl. 200—148 R 20 Claims





12. In a fluid blast circuit breaker comprising: a switching chamber; first and second relatively movable contacts located within said chamber, at least one of said contacts being movable along a predetermined path of travel between a first position in which said contacts are in contact and a second position in which said contacts are separated; said path of travel being along an axis of a nozzle means having a convergent-divergent central passage with a throat defining at least part of said path; said nozzle means located in said switching chamber fixedly disposed relative to one of said contacts such that the other of said contacts extends through said throat only when said contacts are in said first position and is situated axially outside said throat when said contacts are in said second position; means in flow communication with said throat for supplying arc-extinguishing fluid in a blast to said throat when said contacts are

moved from said first position to cool any arc occurring between said contacts, the improvement comprising:

said central passage and said throat of said nozzle means and said contacts having an elliptical cross section transverse to the nozzle means axis, with a first dimension of said cross section having a length of approximately 1¼ to approximately 8 times the length of a second dimension of said cross section perpendicular to said first dimension, and said nozzle and said one of said contacts being disposed such that a narrow eliptical gap is formed therebetween.

4,224,491

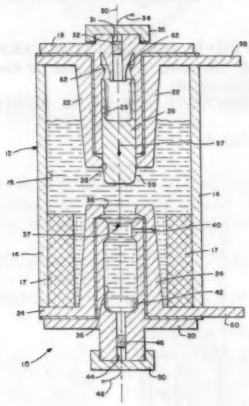
CHEMICALLY ACTIVATED SWITCH

Peter J. Kroon, Swarthmore, Pa., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Mar. 16, 1978, Ser. No. 887,172

Int. Cl.[2] H01H *33/68*

U.S. Cl. 200—150 R **22 Claims**



1. A chemically activated switch for use in controlling currents associated with power line faults comprising: a housing, a pair of relatively movable electrode members in said housing, said electrode members being movable between a closed position in which said electrode members are in mutual contact and an open position in which said electrode members are separated, first propellant receiving means disposed to drive said electrode members into said closed position upon detonation of a chemical propellant in said first propellant receiving means, second propellant receiving means disposed to drive said electrode members into said open position upon detonation of a chemical propellant in said second propellant receiving means, and a dielectric liquid in said housing for transmitting motive force from the vicinity of said second propellant receiving means to said electrode members to separate said electrode members.

4,224,492

WIPER MECHANISMS

Norman L. Hood, Coventry, England, assignor to Lucas Industries Limited, Birmingham, England

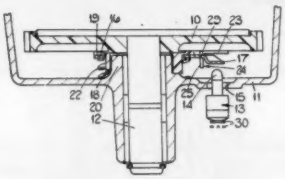
Filed Dec. 14, 1978, Ser. No. 969,511

Claims priority, application United Kingdom, Jan. 6, 1978, 444/78

Int. Cl.[3] H01H *3/00*; B60S *1/08*; H02R *3/10*

U.S. Cl. 200—153 L **8 Claims**

1. In a reversible motor-operated wiper mechanism including a rotary member through which drive is imparted to a wiper from the reversible motor, a device for operating a limit switch for stopping the motor at a parked position of the wiper, said device comprising a limit switch-operating element mounted, in use, for rotation about the axis of the rotary member, an actuating member mounted for rotation, in use, with the rotary member, said actuating member being rotatable relative to said operating element but drivingly engageable therewith in forward and reverse directions of rotation of the rotary member, said actuating member and switch-operating element being arranged so that, in the forward direction of rotation of



the rotary member, said operating element is urged into a position in which the limit switch lies out of its path of movement and, in the reverse direction of rotation of the rotary member, said operating element is urged into a position in which the limit switch lies in its path of movement so that the limit switch is operated at a predetermined angular position of the rotary member only when the latter is rotating in the reverse direction.

4,224,493

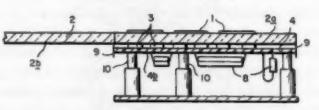
CONTACT SWITCH ARRANGEMENT

Siegfried Pretzsch, Dürerstrasse 21a, D-5657 Haan, Fed. Rep. of Germany

Filed Dec. 22, 1978, Ser. No. 972,376

Int. Cl.[3] H01H *9/00*; H05K *1/00*

U.S. Cl. 200—292 **6 Claims**



1. A contact switch arrangement which comprises

(a) a first plate having a back side and a front side with metal alloys deposited on the front side within position pressure areas;

(b) a carrier plate of a printed circuit having a back side and a front side, the back side having contacting surfaces thereon conductively connectable with switch elements of the carrier plate of the printed circuit; and

(c) resilient pin means in contacting engagement with the front of the carrier plate to bias the carrier plate outwardly, the backs of the first plate and the carrier plate in contacting engagement, the metal alloys in register with the contacting surfaces.

4,224,494

BRAZING PRESS FOR BRAZING CLADDINGS TO PRESSINGS INCLUDING A FLAT BOTTOM SURROUNDED BY CURVED PORTIONS

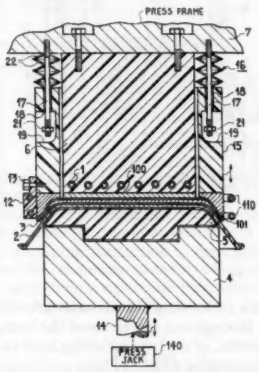
Jean Reboux, and Joël Guilloteau, both of Paris, France, assignors to Tocco-Stel, Paris, France

Continuation-in-part of Ser. No. 847,988, Nov. 2, 1977, abandoned, which is a continuation-in-part of Ser. No. 782,483, Mar. 29, 1977, abandoned. This application Oct. 17, 1978, Ser. No. 952,229

Claims priority, application France, Oct. 5, 1976, 76 29897; Jan. 31, 1978, 78 02664

Int. Cl.[2] H05B *5/00;* B23K *13/00*

U.S. Cl. 219—9.5 25 Claims



1. A brazing press for assembling receptacles having a layered bottom portion obtained by joining a pressing having a flat bottom, a sidewall symmetrical about an axis normal to said bottom and a curved portion linking said bottom to said sidewall, to a preformed cladding having a central portion for covering at least part of said curved portion, said press being of the type having a press jack for exerting pressure mounted on a fixed supporting frame and comprising, in combination, mandrel means for supporting said pressing and said cladding in a superposed relation, reciprocable by means of said jack, a block containing main inductor means, located above and coaxially with said mandrel means and fixedly secured to said frame, intermediate heating means of a ferromagnetic metal made of two separate parts, including a flat central part associated with the bottom face of said block, magnetically coupled to said main inductor means for heating and applying pressure to said central cladding portion, and an annular peripheral part having an inner face matching the shape of the outer face of the peripheral cladding portion, supplementary inductor means surrounding and magnetically coupled to said annular peripheral part for heating it, a sleeve member of electrically insulating material encompassing said block coaxially, spring means for displaceably coupling the upper end of said sleeve member to said frame, guide means for axially guiding the displacements of said sleeve member relatively to said frame, said sleeve member being arranged to carry at its lower end said annular peripheral part and said supplementary inductor means, and retaining means for determining the axially most distant position of said sleeve member relatively to said fixed block under the urging force of said spring means, to thereby obtain two different independent pressures exerted respectively on said central and said peripheral portion of said cladding by means of said press jack to facilitate the independent deformation of said peripheral cladding portion when heated and when said jack urges said mandrel against said block.

4,224,495

ELECTRICAL DISCHARGE MACHINING APPARATUS WITH COMPOUND ELECTRODE MOVEMENT

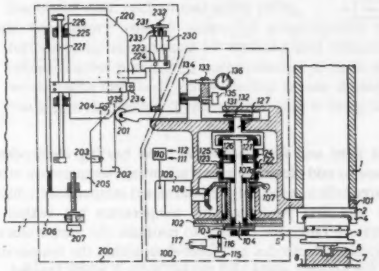
Paul Fricker; Gottfried Vogler, both of Locarno; Hans-Rudolf Knecht, Lugano; Giampaolo Pierobon, Cadempino; Bernd Schumacher, and Arnold Zimmerman, both of Losone, all of Switzerland, assignors to A.G. für industrielle Elektronik AGIE Losone b. Locarno, Losone, Switzerland

Filed Dec. 13, 1977, Ser. No. 860,184

Claims priority, application Switzerland, Dec. 17, 1976, 15917/76; Jul. 27, 1977, 9297/77

Int. Cl.[2] B23P *1/12*

U.S. Cl. 219—69 V 6 Claims



1. Electrical discharge machining apparatus of the type in which a discharge electrode (6) has more than one controlled movement with respect to a workpiece (7) superimposed thereon, the process regulation for the additional superimposing movement being derived from control of the main erosion process movement, comprising

means coupled to the electrode producing a planetary relative movement and an eccentric relative movement between the two electrodes (6) and the workpiece;

process control means (110) electrically controlling the rotary speed of the planetary movement;

and means (200) including a template (202) shaped for process controlling the eccentric movement of the electrode separately from the rotary speed control means wherein said means controlling the eccentric movement of the electrode comprises a first template (202) controlling the eccentric movement of the discharge electrode in dependence on the main erosion movement;

a second template (220) shaped to control retraction of the discharge electrode in the center of its main erosion movement;

and means (223, 224) placing said second template in operative condition in case of process disturbance or fault during operation of the apparatus.

4,224,496

METHOD AND APPARATUS FOR CONTROLLING A BRAZING MACHINE

Edward D. Riordan, South Somerville, and John P. Mangan, Iselin, both of N.J., assignors to Joyal Products, Inc., Linden, N.J.

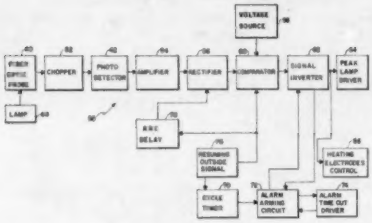
Filed Oct. 12, 1978, Ser. No. 950,819

Int. Cl.[2] B23K *11/24*

U.S. Cl. 219—110 17 Claims

1. Apparatus for controlling heating electrodes for forming a brazed joint between an armature wire and a commutator bar, comprising electrodes for heating said armature wire and said commutator bar at the point where they are to be joined, means for moving said heating electrodes into and out of contact with said armature wire and commutator bar so as to form said joint, fiber-optic means for transmitting radiant energy emitted from a point on said commutator bar at or adjacent to

said joint and displaced from said heating electrodes as said joint area is being heated, means for converting said radiant energy into a usable electrical signal representative of the temperature of said joint area, and means for deactivating said heating electrodes in response to said electrical signal when said temperature at said joint area reaches a first predetermined temperature corresponding to the temperature for forming a



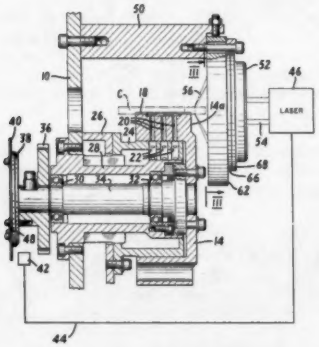
brazed joint and for reactivating said heating electrodes in response to said electrical signal when said temperature at said joint area falls to a second predetermined temperature which is below said first predetermined temperature but within the temperature range for brazing to maintain the temperature of said housing electrodes and joint area within the temperature range for brazing while said brazed joint is being formed.

4,224,497

METHOD FOR MAKING FILTER CIGARETTES USING LIGHT ENERGY TO MAKE PERFORATIONS IN THE FILTER TIPPING WRAP

Walter W. Duley, King City, Canada; A. Clifton Lilly, Jr., Richmond, Va.; Warren E. Claflin, Bon Air, Va.; Edward B. Stultz, Richmond, Va., and Peter Martin, Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed May 22, 1978, Ser. No. 908,520
Int. Cl.[2] B23K *27/00*
U.S. Cl. 219—121 LM **10 Claims**



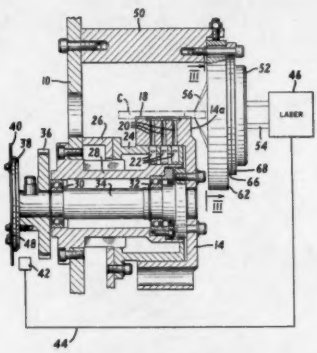
1. In a method for making filter cigarettes wherein tobacco rods are formed and wrapped and then joined to filter plugs bearing filter tipping wrap, and circumferentially spaced perforations are made simultaneously in said filter tipping wrap of each cigarette by exposure of the outer surface of said filter tipping wrap to light energy, the improvement wherein such exposure step is practiced by generating a pulse of light and conducting separate spatial parts thereof simultaneously to locations circumferentially spaced on said outer surface.

4,224,498

APPARATUS FOR PERFORATING ARTICLES BY LASER

Everett C. Grollimund, Midlothian, Va.; Walter W. Duley, King City, Canada; A. Clifton Lilly, Jr., Richmond, Va.; Warren E. Claflin, Bon Air, Va.; Edward B. Stultz, and Peter Martin, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed May 22, 1978, Ser. No. 908,522
Int. Cl.[2] B23K *27/00*
U.S. Cl. 219—121 L **9 Claims**



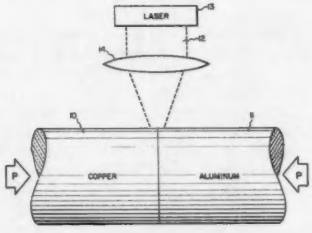
1. In a cigarette perforating apparatus for providing perforations extending through and spaced about the outer peripheral surface of a cigarette, of the type including light energy generator means for generating a pulse of light and optical means for receiving such light pulse the improvement wherein said optical meand comprises means for simultaneously conducting separate spatial parts of said light pulse in respective different light paths intersecting respective different locations spaced about such outer peripheral surface.

4,224,499

LASER WELDING ALUMINUM TO COPPER

Marshall G. Jones, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Oct. 20, 1978, Ser. No. 953,019
Int. Cl.[2] B23K *27/00*
U.S. Cl. 219—121 LM **6 Claims**



1. A method of welding an aluminum conductor to a copper conductor comprising the steps of: butting together the conductors with a contact pressure greater than 100 pounds per square inch and, while maintaining the contact pressure, delivering a single laser pulse to the aluminum-copper interface having a pulse width of approximately 8 milliseconds and a wavelength not exceeding 1.06 micrometers, said laser pulse having sufficient energy to heat and melt metal adjacent the interface and force molten material outwardly into a flash

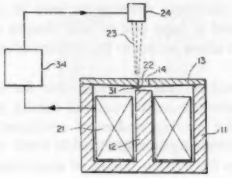
containing intermetallics while leaving a narrow fusion zone substantially free of intermetallics.

4,224,500

METHOD FOR ADJUSTING ELECTRICAL DEVICES

David G. Cruickshank, Hopewell Township, Mercer County, and Jose M. Muniz, Woodbridge Township, Middlesex County, both of N.J., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,585
Int. Cl.³ B23K 9/00
U.S. Cl. 219—121 LE **5 Claims**



1. A method for altering an electrical characteristic of a device wherein that characteristic is dependent upon an air gap between sections of the device, the method comprising:

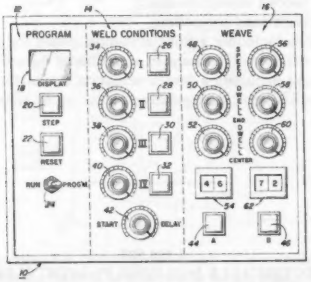
heating a selected portion of at least one of the sections to cause a portion of the section to flow into the air gap to decrease the minimum distance between the sections, while maintaining a separation therebetween, to alter the electrical characteristic of the device.

4,224,501

TEACHING ARRANGEMENT FOR PROGRAMMABLE MANIPULATOR

Torsten H. Lindbom, Brookfield, and Donald W. Munger, New Milford, both of Conn., assignors to Unimation, Inc., Danbury, Conn.

Filed Feb. 27, 1978, Ser. No. 881,395
Int. Cl.² B23K 9/12; B25J 9/00
U.S. Cl. 219—124.34 **55 Claims**



1. In a programmable manipulator having an arm movable in a plurality of controllable axes,

means for generating signals during a teach phase representing positions described by one end of said arm along one or more work paths, said work paths each comprising a predetermined element in a work path sequence to define an overall work cycle;

supervisory programming control means independent of said path signal generating means for programming control parameters independently of and prior to said teach phase in a supervisory programming phase, said control parameters representing movement and control of said arm independent of said work path signals, each of said control parameters being associated with one or more of said work paths in said sequence, said supervisory control parameter programming means comprising means for selecting and sequentially storing said control parameters during said supervisory programming phase and prior to said teach phase in a format identified by said work path sequence; and

manipulator main memory means for storing said generated work path signals and said programmed control parameters in a predetermined relationship for use in generating command signals in a replay mode, said generated work path signals being stored in a predetermined relationship representing said work path sequence, a plurality of work path signals and at least one control parameter being associated with each of said work paths,

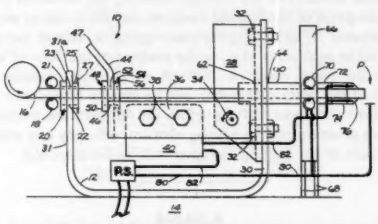
said supervisory control parameter programming means further comprising means for entering said selected and stored control parameters corresponding to each of said work paths into said replay storing means during said teach phase as each respective work path is being taught.

4,224,502

AUTOMATIC WELDING FEEDER SHUT OFF

Edgar C. Weaver, St. Charles, and James H. Vaughan, Town & Country, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Aug. 31, 1978, Ser. No. 938,566
Int. Cl.² B23K 9/32
U.S. Cl. 219—137.2 **4 Claims**



1. In a welding assembly including a roll of weld wire, a weld wire support including a generally vertically extending support having means attached thereto for supporting weld wire passing therethrough; at least one pair of feed rolls for moving said weld wire toward a work piece to be welded; a welding nozzle body and a welding tip; the improvement comprising a switch assembly including a switch arm pivotably mounted upon said weld wire support; said switch arm having a mercury switch mounted thereon; said switch having leads connected thereto in series with welding current for forming an arc for welding; said switch arm including switch support means supported by said weld wire in its path toward the work piece in a first position; the mercury in said switch in said first position maintaining electrical current flow between at least a pair of contacts in the switch to the work piece to form a welding arc; and in a second open position said mercury being out of contact with at least one of said contacts and thereby stopping the flow of current to the welding arc; whereby when the end of said weld wire passes through said switch support means, said mercury switch pivots vertically due to gravity about said weld wire support and said mercury moves from said first closed position to said second open position and thereby stops flow of current flow to the arc.

4,224,503

COFFEEMAKER WATER HEATER HAVING AN ARRANGEMENT FOR THERMALLY REMOVING SCALE DEPOSITS

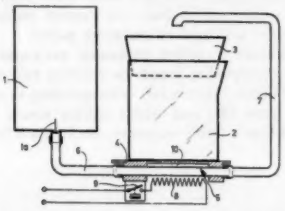
Jacobus M. Gijzel, Groningen, and Andries T. Reeder, Drachten, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 4, 1977, Ser. No. 848,463

Claims priority, application Netherlands, Dec. 22, 1976, 7614235

Int. Cl.[2] **H05B** *1/02;* **F24H** *7/00;* **F28G** *13/00;* **A47J** *31/56*

U.S. Cl. 219—308 **3 Claims**



1. A coffeemaker which includes a water reservoir; a tubular heating chamber formed of a quartz glass; an electrically operated heating element arranged externally of and in contact with said heating chamber; an inlet tube for conducting water from said water reservoir to and through said heating chamber to be heated therein; an outlet tube for discharging the heated water from the heating chamber over ground coffee; and a switch responsive to the temperature of the wall of said heating chamber for automatically de-energizing said heating element; the heat capacity of the heating chamber, the electrical power consumption of the heating element, and the location and the adjustment of said temperature-responsive switch being so related to each other that, in the absence of the flow of water from the water reservoir through the heating chamber, the walls of the heating chamber will be rapidly heated to a temperature of at least 450° C. before the temperature-responsive switch de-energizes the heating element, whereby any scale on the walls of the heating chamber will be decomposed.

4,224,504

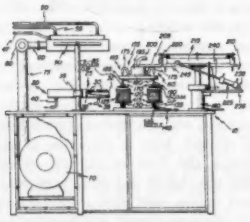
APPARATUS FOR PRACTICING TEMPERATURE GRADIENT ZONE MELTING

Carl A. Erikson; Thomas R. Anthony; Harvey E. Cline, all of Schenectady; Siegwalt Ludke, Scotia, and John O. Fielding, Ballston Lake, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 796,368, May 12, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,492

Int. Cl.[3] **B25J** *15/06;* **F27B** *9/06*

U.S. Cl. 219—388 **23 Claims**



1. An apparatus for the simultaneous processing of one or more bodies of semiconductor material by temperature gradient zone melting, said apparatus comprising:

a closable work chamber for receiving said semiconductor bodies for processing and including a first closure member and a second closure member;

said first closure member having a radiative heating element heat source facing internally of said work chamber for heating said semiconductor bodies;

said second closure member including a heat sink facing internally of said chamber and located opposite to said heat source, said heat sink cooperating with said heat source to produce a relatively uniform temperature gradient within said bodies of semiconductor material;

said closure members defining at least in part said work chamber and at least one of said closure members being movable to allow access to the interior of said work chamber;

means disposed in said work chamber for supporting said bodies of semiconductor material during processing;

first means for storing bodies of semiconductor material prior to processing in said closable work chamber;

second means for storing bodies of semiconductor material after processing in said closable work chamber;

a first actuation means for providing relative movement between said first and said second closure members to effect the opening and closing of said work chamber;

means for transferring one or more bodies of semiconductor material from said first storage means to said closable work chamber, for disposing said one or more bodies on said supporting means, and for transferring said one or more bodies from said supporting means to said second storage means;

manipulative means for selectively engaging and supporting said bodies of semiconductor material during a transferring sequence, said manipulative means comprising

(1) means for selectively attaching to said bodies of semiconductor material, and

(2) a second actuation means for placing said attaining means in contact with said bodies of semiconductor material;

drive means for moving said manipulative means toward and away from a plurality of stations including the interior of said closable work chamber, said first storage means, and said second storage means,

said drive means comprising

(1) means including a third actuation means for propelling said manipulative means in a rectilinear direction, and

(2) means including a fourth actuation means for pivotally propelling said manipulative means in an arcuate direction.

4,224,505

ELECTRICALLY WELDING PLASTIC SLEEVE

Werner Sturm, Hagendorf, Switzerland, assignor to Von Roll AG, Switzerland, a part interest

Filed May 31, 1978, Ser. No. 911,091

Claims priority, application Switzerland, Jun. 3, 1977, 6890/77

Int. Cl.[2] **H05B** *3/58*

U.S. Cl. 219—544 **12 Claims**

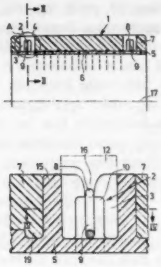
1. An electric plug connection for an electric welding muff having an insulating thermoplastic sleeve with a spirally wound, resistance heating wire embedded therein comprising

a recess formed in the sleeve;

a support member formed in said recess and extending radially relative to the sleeve; and

a portion of the wire adjacent one end thereof exposed in

said recess, said portion being formed in a loop which is coupled to and supported by said support member to



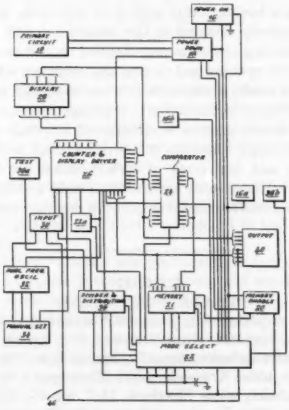
permit the wire to be coupled to an electrical source of energy.

4,224,506

ELECTRONIC COUNTER WITH NON-VOLATILE MEMORY

Vincent G. Coppola, Branford; Edwin G. Grisgraber, Huntington, and John L. Lorenzo, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 24, 1978, Ser. No. 889,627
Int. Cl.³ G06M 3/12
U.S. Cl. 235—92 FP **22 Claims**



1. Apparatus for retaining the count of a volatile memory counter during periods of power loss which comprises:

a non-volatile semiconductor memory;

data transferring means;

means for controlling said memory and memory counter including means responsive to the onset of a power loss for thereupon effecting the transfer of the count from said volatile memory counter to said non-volatile semiconductor memory; and

said controlling means including means responsive to power resumption for thereupon effecting the transfer of the count from said non-volatile memory to said volatile memory counter via said transferring means;

said controlling means comprising

means for comparing the value of each digit stored in said volatile memory counter with each digit stored in said non-volatile memory;

means for stepping the value of each digit stored in said volatile memory counter; and

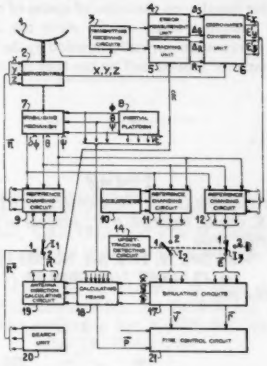
means responsive to said comparing means for stabilizing the value of each digit stored in said volatile memory counter at the value of a digit in said non-volatile memory.

4,224,507

SYSTEM FOR TRACKING A MOVING TARGET WITH RESPECT TO A FRAME OF REFERENCE OF UNVARYING ORIENTATION AND FIXED ORIGIN RELATIVE TO EARTH

Robert Gendreu, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,127
Claims priority, application France, Oct. 21, 1977, 77 31741
Int. Cl.³ G05D 3/00; G06G 7/80; G01S 9/42
U.S. Cl. 235—412 **20 Claims**



1. A system for tracking a moving target with respect to a first frame or reference of unvarying orientation and fixed origin relative to the earth from a movable carrier, said system comprising means disposed on said carrier for measuring positional deviations of said target in a second frame of reference related to said measuring means, means disposed on said carrier for moving said measuring means, and means for controlling said moving means in response to said measured deviations, said controlling means comprising:

first means for converting said measured deviations relative to said second frame of reference into corresponding deviations relative to said first frame of reference;

an inertial platform disposed on said carrier including means for generating a signal related to the speed of said carrier;

first means, responsive to said corresponding deviations, for calculating the estimate position of said target relative to said first frame of reference, said calculating means including means for integrating said carrier speed signal and means responsive to said integrating means for generating a signal related to the estimated position of said target relative to said first frame of reference; and

second means for converting said estimated position relative to said first frame of reference into a corresponding estimated position signal relative to said second frame of reference, said moving means being responsive to said corresponding estimated position signal.

4,224,503

COFFEEMAKER WATER HEATER HAVING AN ARRANGEMENT FOR THERMALLY REMOVING SCALE DEPOSITS

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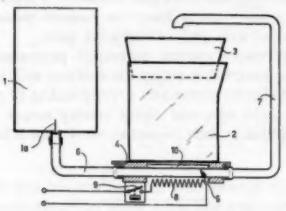
Filed Nov. 4, 1977, Ser. No. 848,463

Claims priority, application Netherlands, Dec. 22, 1976, 7614235

Int. Cl.[2] **H05B** *1/02;* **F24H** *7/00;* **F28G** *13/00;* **A47J** *31/56*

U.S. Cl. 219—308 **3 Claims**



1. A coffeemaker which includes a water reservoir; a tubular heating chamber formed of a quartz glass; an electrically operated heating element arranged externally of and in contact with said heating chamber; an inlet tube for conducting water from said water reservoir to and through said heating chamber to be heated therein; an outlet tube for discharging the heated water from the heating chamber over ground coffee; and a switch responsive to the temperature of the wall of said heating chamber for automatically de-energizing said heating element; the heat capacity of the heating chamber, the electrical power consumption of the heating element, and the location and the adjustment of said temperature-responsive switch being so related to each other that, in the absence of the flow of water from the water reservoir through the heating chamber, the walls of the heating chamber will be rapidly heated to a temperature of at least 450° C. before the temperature-responsive switch de-energizes the heating element, whereby any scale on the walls of the heating chamber will be decomposed.

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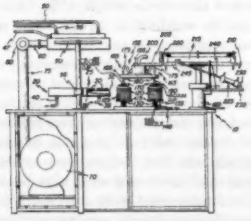
Continuation of Ser. No. 796,368, May 12, 1977, abandoned. This application Jun. 21, 1978, Ser. No. 917,492

Int. Cl.[3] **B25J** *15/06;* **F27B** *9/06*

U.S. Cl. 219—388 **23 Claims**



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said first closure member having a radiative heating element heat source facing internally of said work chamber for heating said semiconductor bodies;

said second closure member including a heat sink facing internally of said chamber and located opposite to said heat source, said heat sink cooperating with said heat source to produce a relatively uniform temperature gradient within said bodies of semiconductor material;

said closure members defining at least in part said work chamber and at least one of said closure members being movable to allow access to the interior of said work chamber;

means disposed in said work chamber for supporting said bodies of semiconductor material during processing;

first means for storing bodies of semiconductor material prior to processing in said closable work chamber;

second means for storing bodies of semiconductor material after processing in said closable work chamber;

a first actuation means for providing relative movement between said first and said second closure members to effect the opening and closing of said work chamber;

means for transferring one or more bodies of semiconductor material from said first storage means to said closable work chamber, for disposing said one or more bodies on said supporting means, and for transferring said one or more bodies from said supporting means to said second storage means;

manipulative means for selectively engaging and supporting said bodies of semiconductor material during a transferring sequence, said manipulative means comprising

(1) means for selectively attaching to said bodies of semiconductor material, and

(2) a second actuation means for placing said attaining means in contact with said bodies of semiconductor material;

drive means for moving said manipulative means toward and away from a plurality of stations including the interior of said closable work chamber, said first storage means, and said second storage means,

said drive means comprising

(1) means including a third actuation means for propelling said manipulative means in a rectilinear direction, and

(2) means including a fourth actuation means for pivotally propelling said manipulative means in an arcuate direction.

4,224,505

ELECTRICALLY WELDING PLASTIC SLEEVE

Werner Sturm, Hagendorf, Switzerland, assignor to Von Roll AG, Switzerland, a part interest

Filed May 31, 1978, Ser. No. 911,091

Claims priority, application Switzerland, Jun. 3, 1977, 6890/77

Int. Cl.[2] **H05B** *3/58*

U.S. Cl. 219—544 **12 Claims**

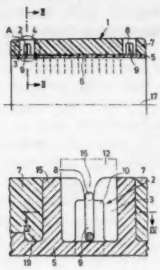
1. An electric plug connection for an electric welding muff having an insulating thermoplastic sleeve with a spirally wound, resistance heating wire embedded therein comprising

a recess formed in the sleeve;

a support member formed in said recess and extending radially relative to the sleeve; and

a portion of the wire adjacent one end thereof exposed in

said recess, said portion being formed in a loop which is coupled to and supported by said support member to



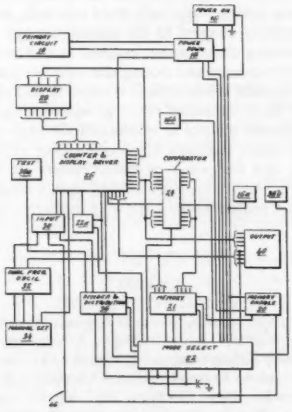
permit the wire to be coupled to an electrical source of energy.

4,224,506

ELECTRONIC COUNTER WITH NON-VOLATILE MEMORY

Vincent G. Coppola, Branford; Edwin G. Grisgraber, Huntington, and John L. Lorenzo, Southbury, all of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 24, 1978, Ser. No. 889,627
Int. Cl.³ G06M *3/12*
U.S. Cl. 235—92 FP **22 Claims**



1. Apparatus for retaining the count of a volatile memory counter during periods of power loss which comprises:

a non-volatile semiconductor memory;

data transferring means;

means for controlling said memory and memory counter including means responsive to the onset of a power loss for thereupon effecting the transfer of the count from said volatile memory counter to said non-volatile semiconductor memory; and

said controlling means including means responsive to power resumption for thereupon effecting the transfer of the count from said non-volatile memory to said volatile memory counter via said transferring means;

said controlling means comprising

means for comparing the value of each digit stored in said volatile memory counter with each digit stored in said non-volatile memory;

means for stepping the value of each digit stored in said volatile memory counter; and

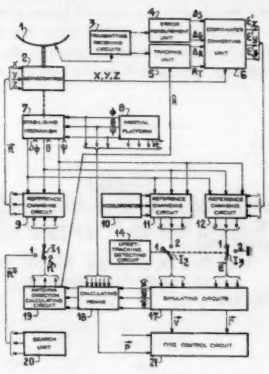
means responsive to said comparing means for stabilizing the value of each digit stored in said volatile memory counter at the value of a digit in said non-volatile memory.

4,224,507

SYSTEM FOR TRACKING A MOVING TARGET WITH RESPECT TO A FRAME OF REFERENCE OF UNVARYING ORIENTATION AND FIXED ORIGIN RELATIVE TO EARTH

Robert Gendreu, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 17, 1978, Ser. No. 952,127
Claims priority, application France, Oct. 21, 1977, 77 31741
Int. Cl.³ G05D *3/00*; G06G *7/80*; G01S *9/42*
U.S. Cl. 235—412 **20 Claims**



1. A system for tracking a moving target with respect to a first frame or reference of unvarying orientation and fixed origin relative to the earth from a movable carrier, said system comprising means disposed on said carrier for measuring positional deviations of said target in a second frame of reference related to said measuring means, means disposed on said carrier for moving said measuring means, and means for controlling said moving means in response to said measured deviations, said controlling means comprising:

first means for converting said measured deviations relative to said second frame of reference into corresponding deviations relative to said first frame of reference;

an inertial platform disposed on said carrier including means for generating a signal related to the speed of said carrier;

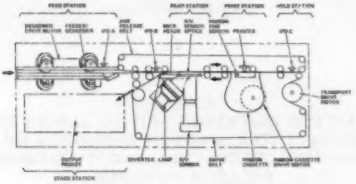
first means, responsive to said corresponding deviations, for calculating the estimate position of said target relative to said first frame of reference, said calculating means including means for integrating said carrier speed signal and means responsive to said integrating means for generating a signal related to the estimated position of said target relative to said first frame of reference; and

second means for converting said estimated position relative to said first frame of reference into a corresponding estimated position signal relative to said second frame of reference, said moving means being responsive to said corresponding estimated position signal.

4,224,508
ERROR CORRECTING BAR CODE READER

Charles T. Kao, Richardson, Tex., assignor to Recognition Equipment Incorporated, Irving, Tex.

Filed Nov. 13, 1978, Ser. No. 959,978
Int. Cl.[2] G06K 5/00, 9/18, 19/06, 7/10
U.S. Cl. 235—437 12 Claims

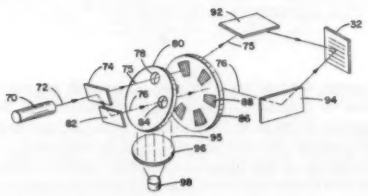


1. An error detecting and correcting bar code character reader having a fixed number of vertical bars and a fixed number of spaces of different widths, comprising; means for determining the number of spaces between bars and the number of spaces of each width, means for determining the order of occurence of the spaces of each width, means for identifying the character based upon the order of spaces of each width and means for detecting when one or more bar is missing and supply the information normally supplied by the missing bar so that the character represented by the bars can be read.

4,224,509
HOLOGRAPHIC SCANNING SYSTEM

Charles C. K. Cheng, Pittsford, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Oct. 19, 1978, Ser. No. 953,155
Int. Cl.[2] G06K 7/10; G02B 27/17
U.S. Cl. 235—457 13 Claims



1. Apparatus for generating a multiple-line scan pattern in a code reader system comprising:

a source of radiant energy beams;

a plurality of holograms circumferentially mounted on a rotating support member, each hologram being an optical representation of a continuous line segment offset to the line of projection of each of the other of said holograms;

means for causing a plurality of parallel radiant energy beams to be directed at more than one location in the plane of the circumferentially mounted holograms wherein during rotation of the support member, each hologram will be orientated at a different angle when intersecting each parallel radiant energy beam to form a plurality of intersecting offset line segments;

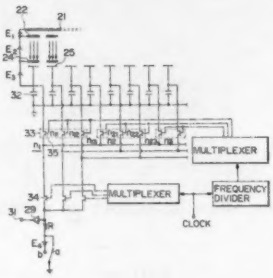
means for directing said line segments onto a scan area in the form of a multi-line intersecting scan pattern through which passes an object to be scanned;

and means for detecting changes in the radiant energy reflected from the objects passing through said scan pattern.

4,224,510
ORIGINAL DOCUMENT READING APPARATUS

Mutsuo Takenouchi, and Takashi Ozawa, both of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1978, Ser. No. 946,300
Claims priority, application Japan, Sep. 29, 1977, 52-116044
Int. Cl.[2] H01J 39/12
U.S. Cl. 250—207 10 Claims



1. A document reading apparatus comprising: a photocathode having an image of the document focused thereon and emitting photoelectrons therefrom, an array of secondary electron multipliers for multiplying photoelectrons emitted from said photocathode, a plurality of anodes facing said secondary electron multipliers, capacitor means connected between said anodes and ground, first and second series circuits including switch means associated therewith, each of said switch means having source and drain terminals, load resistor means selectively coupled to the anodes through said series circuits, scanning circuit means coupled to said switch means for selectively opening and closing said switches whereby said load resistor means is sequentially coupled to said anodes, said first switch means separated into n groups each containing m switches wherein control is effectuated for each group and wherein the drain terminals of corresponding m switches in each group said first array of switch means are commonly connected to the source terminals of said second array of switch means, and means for amplifying the output of said load resistor.

4,224,511
IMAGE INTENSIFIER

Gennady I. Brjukhnevich, prospekt Vernadskogo, 66, kv. 16; Nikolai S. Vorobiev, ulitsa Panfilova, 4/5, kv. 88; Viktor A. Miller, ulitsa Aviatsionnaya, 74, korpus 4, kv. 80; Valdis E. Postovalov, ulitsa Krasnodarskaya, 57, korpus 1, kv. 61; Mikhail Y. Schelev, ulitsa Chkalova, 12/7, kv. 17; Alexandr M. Prokhorov, ulitsa Zvenigorodskaya, 4, kv. 10; Jury N. Serdjuchenko, Yasenevo, 2 Mikroraion, korpus 3, kv. 449; Boris M. Stepanov, Leninsky prospekt, 57, kv. 34; Boris D. Smolkin, ulitsa Chkalova, 4½, kv. 80; Lidia I. Kondrashova, Profsojuznaya ulitsa, 115, kv. 39, and Valentin F. Lukin, Chertanovskaya ulitsa, 21, korpus 1, kv. 50, all of Moscow, U.S.S.R.

Filed Jan. 5, 1979, Ser. No. 1,370
Int. Cl.[2] H01J 31/50
U.S. Cl. 250—213 VT 5 Claims

1. An image intensifier comprising:

an evacuated tube envelope;

a photocathode disposed within one end of said evacuated tube envelope;

a fluorescent screen disposed within the opposite end of said evacuated tube envelope;

an accelerating electrode disposed within said evacuated tube envelope after said photocathode;

a hollow cylinder of said accelerating electrode;

an element of said accelerating electrode, disposed within said hollow cylinder of said accelerating electrode;

a grid rigidly fixed on that end of said element of said accelerating electrode which faces said photocathode;

a focusing electrode disposed within said evacuated tube envelope after said accelerating electrode and constituting a hollow cylinder having a diameter equal to the diameter of said hollow cylinder of said accelerating electrode;

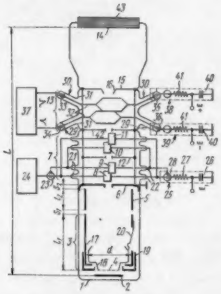
an anode diaphragm disposed after said focusing electrode;

an electronic gate disposed after said anode diaphragm, constituting a through type two-conductor circuit, and having terminals on said evacuated tube envelope, selected ones of said terminals being used to connect corresponding pulse generators, and respective ones of said terminals being used to connect matching circuits each having a terminating load;

a diaphragm of said electronic gate;

deflecting plates of said electronic gate;

an image scanning system disposed after said electronic gate, constituting a through-type two-conductor circuit, and



having terminals on said evacuated tube envelope, selected ones of said terminals being used to connect corresponding pulse generators, and respective ones of said terminals being used to connect matching circuits each having a terminating load;

an electronic trap disposed within said evacuated tube envelope between said image scanning system and said fluorescent screen and electrically connected to said anode diaphragm;

the distance L between said photocathode and said fluorescent screen, the distance S_1 between said accelerating and focusing electrodes, the distance S_2 between said focusing electrode and said anode diaphragm, as well as the lengths l_1, l_2 of said cylinders of said accelerating and focusing electrodes, respectively, related to said diameter d of said focusing electrode as follows:

$L=(7.1 \text{ to } 8.6)d$

$S_1=(0.10 \text{ to } 0.14)d$

$S_2=(0.08 \text{ to } 0.19)d$

$l_1=(1.1 \text{ to } 1.45)d$

$l_2=(0.57 \text{ to } 0.77)d$

4,224,512

HIGHLY SENSITIVE NON-REFRIGERATED RADIATION SENSOR

Eduardo J. Peralta, Santa Ana, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Jan. 15, 1979, Ser. No. 3,691

Int. Cl.³ H01J *40/14*

U.S. Cl. 250—215 **8 Claims**

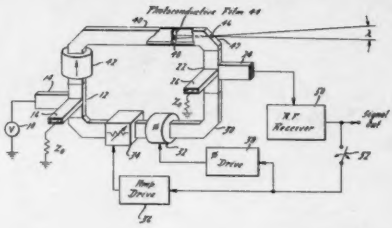
1. An RF bridge for detecting electromagnetic radiation received from a remote source, comprising:

means for generating RF energy;

means defining a test arm for conducting a portion of said RF energy;

means defining a reference arm for conducting another portion of said RF energy;

means receiving said RF energy conducted by said test arm means and said reference arm means;



wherein said test arm means includes a photoconductive material mounted to impede said RF energy conducting therethrough and means for receiving said electromagnetic radiation from said remote source and directing said radiation onto said photoconductive material.

4,224,513

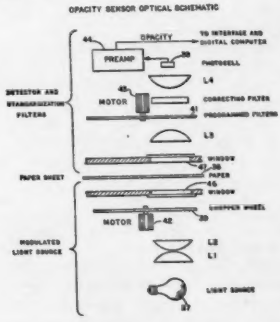
APPARATUS FOR THE ON-LINE MEASUREMENT OF THE OPACITY OF A PAPER SHEET

Joseph M. Casey, Santa Clara, and Erik B. Dahlin, Saratoga, both of Calif., assignors to Measurex Corporation, Cupertino, Calif.

Continuation of Ser. No. 509,127, Sep. 25, 1974, abandoned, which is a continuation of Ser. No. 346,878, Apr. 2, 1973, abandoned. This application Apr. 6, 1978, Ser. No. 894,182

Int. Cl.² H01J *3/14*

U.S. Cl. 250—216 **1 Claim**

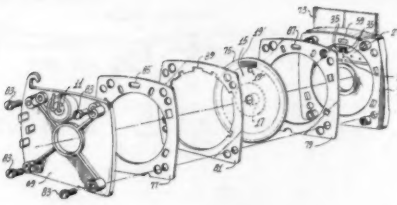


1. Apparatus for measuring the opacity of a moving sheet of paper or the like comprising: a visible light source; a visible light detector; means for supporting said light source and detector on opposite sides of said sheet; a first diffusing window between said source and said sheet; a second diffusing window between said detector and said sheet; and means for sensing the amount of light transmitted through said sheet and providing a signal related to opacity of the sheet.

4,224,514
OPTICAL ENCODER

Otto K. Weber, Chatsworth, Calif., assignor to Sensor Technology, Inc., Chatsworth, Calif.

Filed Jun. 16, 1978, Ser. No. 916,226
Int. Cl.[3] G01D 5/34
U.S. Cl. 250—231 SE 9 Claims



1. An optical encoder for producing an output indicative of angular shaft rotation comprising:

a housing having an opening through which said shaft can freely pass, and having a narrow circular interior chamber,

a code disc having a hub for attachment to said shaft for rotation thereby, said disc being situated within and having a smaller diameter than said chamber, said chamber thereby accommodating limited radial offset of said shaft and disc with respect to said housing,

said code disc having near its periphery a plurality of equally spaced, radially extending transparent regions separated by opaque regions,

a single light source mounted in said housing on one side of said chamber,

a single silicon chip containing a phototransducer array having a single diffusion layer, said chip being mounted in said housing on the opposite side of said chamber so as to be illuminated by light from said source passing through ones of said slots as said code disc is rotated by said shaft, the plane of said transducer array being substantially parallel to but spaced from said disc,

said phototransducer array including first, second, third and fourth phototransducers arranged in quadrants in said plane, said quadrants being separated by a first axis aligned radially to said shaft and a second axis generally perpendicular to said first axis,

the radical height of said transparent regions on said disc being greater than the radial extent of said first through fourth phototransducers,

a mask mounted in said housing between said disc and said phototransducer array, said mask having four sets of slots situated respectively in front of said first through fourth phototransducers, said slots extending radially with respect to said shaft, the slots of each set being equal in width and spacing to the transparent regions on said encoder disc, each set of slots being differently angularly offset with respect to said first axis so that as said disc is rotated by said shaft, the respective first through fourth phototransducers will be maximally illuminated at successively different angular orientations of said encoder disc,

a first differential amplifier circuit connected to first and second phototransducers which are situated respectively in quadrants on opposite sides of said first axis, for producing a first difference signal indicative of the difference between the outputs of said first and second phototransducers, and

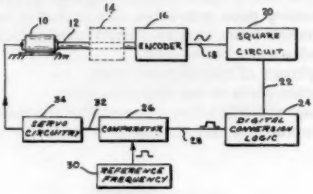
a second differential amplifier circuit connected to said third and fourth phototransducers that also are situated respectively in quadrants on opposite sides of said first axis, for producing a second difference signal indicative of the difference between the outputs of said third and fourth phototransducers,

the phase of each first and second difference signals being indicative of said angular shaft rotation and being substantially independent of limited radial offset of said shaft and disc with respect to said housing along at least one of said two axes.

4,224,515
HIGH ACCURACY OPTICAL SHAFT ENCODER SYSTEM

Mark C. Terrell, Burlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Oct. 27, 1978, Ser. No. 955,295
Int. Cl.[2] G01D 5/34
U.S. Cl. 250—231 SE 4 Claims

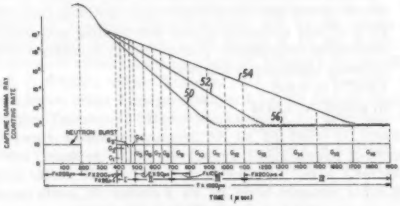


1. A high accuracy optical shaft encoder system, comprising an electrically powered motor having a rotating shaft; optical shaft encoder means for measuring the rotation speed of the shaft and providing an electrical output having a waveform indicative of said rotational speed; means for multiplying the waveform by a predetermined factor; means connected to said multiplying means for converting the wave forms to a logical binary waveform; means for generating a standard reference signal of known waveform characteristics; means for receiving said logical binary waveform and said reference wave form, comparing the waveforms indicative of the difference between the waveforms, and means for converting the difference signal to a control voltage connected between the signal comparing means and the electrically powered motor.

4,224,516
METHODS AND APPARATUS FOR MEASURING THERMAL NEUTRON DECAY CHARACTERISTICS OF EARTH FORMATIONS

Charles W. Johnstone, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 955,176
Int. Cl.[2] G01V 5/00
U.S. Cl. 250—262 57 Claims



1. A method for measuring a thermal neutron decay characteristic of an earth formation, comprising the steps of:

(a) irradiating a formation with a plurality of discrete bursts of fast neutrons;

(b) selecting, as a function of a known value of the thermal neutron decay characteristic of the formation to be measured, a certain set of two different measurement intervals following each neutron burst from among a number of such sets of two measurement intervals, each of such sets

of measurement intervals corresponding to a particular range of values of said decay characteristic, said certain set of measurement intervals selected being that set which corresponds to the decay characteristic value range which encompasses said known value of the decay characteristic;

(c) measuring indications of the thermal neutron concentration in the formation during each of said measurement intervals in said selected set following each neutron burst;

(d) forming a ratio R of the measurements made in step (c) accumulated over said plurality of neutron bursts.

(e) determining a new value of said decay characteristic as a function of the value of the ratio R formed in step (d); and

(f) repeating steps (a) through (e) using the new value of the decay characteristic determined in step (e) above as the known value of the decay characteristic in new step (b).

4,224,517

DEVICE FOR ASSAYING URANIUM AND/OR THORIUM IN ORE SPECIMENS COMPRISING GOLD FOIL FOR SUPPRESSING COMPTON BACKGROUND

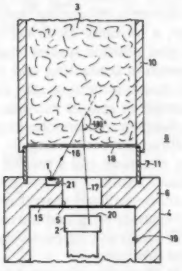
Andrzej Lubecki, Stutensee, and Klaus Rieber, Eggenstein-Leop, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Filed Jun. 15, 1978, Ser. No. 915,778

Claims priority, application Fed. Rep. of Germany, Jun. 22, 1977, 2727989

Int. Cl.[2] G01N *23/20, 33/20, 23/223;* **H01J** *37/20*

U.S. Cl. 250—272 **3 Claims**



1. A device for assaying uranium and/or thorium present in ore specimens in concentrations above approximately 20 ppm according to the energy dispersive X-ray fluorescence technique, comprising: a support member for supporting an ore specimen; and a gamma source detector system located below said support member and including a gamma source supplying gamma radiation to the specimen in order to produce, in the specimen, radiation containing X-ray K-lines, a detector disposed for detecting the X-ray K-lines of the radiation from the specimen, a collimator provided with an aperture located between said gamma source and said detector, said gamma source being secured at a wall of said collimator close to said aperture, and a gold foil member extending across, and closing, said aperture, in order to suppress the Compton background, and wherein said support member surrounds said aperture and encloses said source in order to shield said source relative to the surrounding environment.

4,224,518

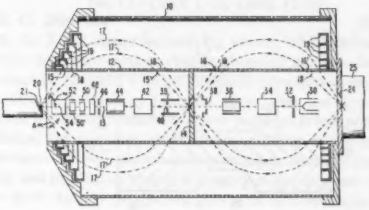
MULTISTAGE CYLINDRICAL MIRROR ANALYZER INCORPORATING A COAXIAL ELECTRON GUN

Norman J. Taylor, Los Altos, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 822,766, Aug. 8, 1977, abandoned. This application Dec. 21, 1978, Ser. No. 972,192

Int. Cl.[3] H01J *39/00*

U.S. Cl. 250—305 **4 Claims**



1. The method of minimizing the aberration of a scanning charged particle beam, said scanning introduced by deflecting said beam transverse to an axis of beam transport, said aberration introduced by passing said scanning beam through an electro-optical lense on said axis, comprising

deflecting said beam away from said axis in a first deflection region,

deflecting said beam toward said axis in a second deflection region, said latter deflection causing said beam to cross said axis at the center of said lense.

4,224,519

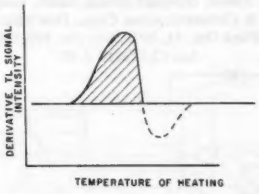
METHOD OF IMPROVING BEO AS A THERMOLUMINESCENT DETECTOR

Richard B. Gammage, Oak Ridge, Tenn.; John H. Thorngate, Livermore, Calif., and Danny J. Christian, Knoxville, Tenn., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Jun. 26, 1979, Ser. No. 52,179

Int. Cl.[2] G01T *1/11*

U.S. Cl. 250—337 **3 Claims**

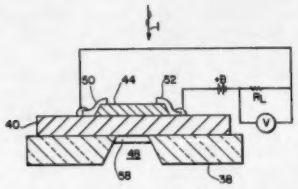


1. An improved method for discriminating against an interferring pyroelectric incandescence and thus lowering the minimum detectable level of a radiation-exposed, thermoluminescent detector, comprising the steps of heating said exposed detector in a reader unit, coupling the resultant signal from said reader unit to a photomultiplier, blocking the d.c. portion of the output signal from said photomultiplier, differentiating the remaining portion of said photomultiplier output signal to provide a signal shape having a positive-going portion and a negative-going portion, determining the zero-crossover of said signal shape, and clipping said negative-going portion, resulting in a final output signal wherein the positive portion of said pulse shape is highly proportional to the radiation-induced luminescence of said detector and said interferring pyroelectric incandescence of said detector is suppressed, thereby effecting said lowering of the minimum detectable level.

4,224,520
ROOM TEMPERATURE TWO COLOR INFRARED DETECTOR

Richard F. Greene, Bethesda, and Kurt P. Scharnhorst, Columbia, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 13, 1979, Ser. No. 57,612
Int. Cl.[2] G01J 1/00
U.S. Cl. 250—338 5 Claims

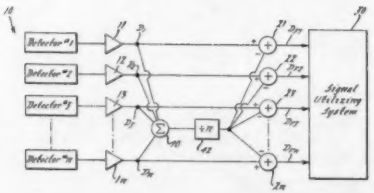


2. A detector of electromagnetic radiation, comprising:
a silicon substrate;
a layer of silicon-dioxide formed upon the substrate, for absorption of radiation in a fist spectrum;
a cavity in the substrate adjoining a central area of the layer;
an amorphous film of a semiconducting material transparent to radiation in the first spectrum, disposed upon the layer over the cavity; and
a pair of electrical contacts oppositely disposed about the film across the cavity.

4,224,521
MICROPHONICS ELIMINATION CIRCUIT

Forest F. R. Fisher, Newport Beach, Calif., assignor to Ford Aerospace & Communications Corp., Dearborn, Mich.

Filed Oct. 11, 1978, Ser. No. 950,334
Int. Cl.[3] G01J 1/00
U.S. Cl. 250—340 2 Claims

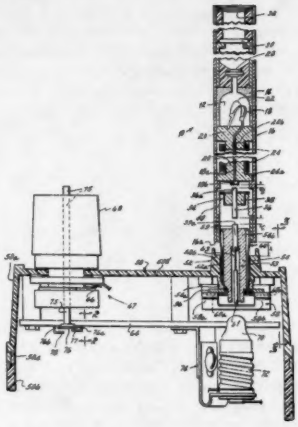


2. A method of processing signals output from a commonly mounted array of like pyroelectric detectors to eliminate correlative signal components, such as mirophonics, including the steps of:
summing the pyroelectric detector output signals;
dividing said summed signal by the number of detectors to produce an averaged signal; and
subtracting the averaged signal for each detector output signal to produce a correspondingly corrected output signal for each detector.

4,224,522
DOSIMETER CHARGING AND/OR READING APPARATUS

Thomas P. Jackson, and Laughton T. Fine, both of Cincinnati, Ohio, assignors to Dosimeter Corporation of America, Cincinnati, Ohio

Filed Aug. 29, 1978, Ser. No. 937,808
Int. Cl.[2] G01T 1/18
U.S. Cl. 250—377 5 Claims



1. Apparatus for charging a dosimeter having a capacitor connected between first and second relatively stationary electrodes, an ionization chamber exposed to at least portions of said first and second electrodes to discharge said capacitor when ionizing radiation penetrates said chamber, a movable electrode electrically connected to said first electrode which deflects varying amounts depending upon the charge present on said capacitor, a movable electrical contact shiftable between a noncharging position spaced from said first electrode and a charging position contacting said first electrode, and a first electrical insulator mounting said movable contact and said second electrode in spaced relation when said movable contact is in its charging and noncharging positions, said dosimeter charger apparatus comprising:
a first charging electrode and a second charging electrode,
a second electrical insulator mounting said first and second charger electrodes in fixed spaced relation to each other susceptive of contact with said movable contact and second dosimeter electrode, respectively, when it is desired to charge said dosimeter,
a high voltage D.C. supply connected between said first and second charger electrodes for applying therebetween a charging potential when said power supply is energized,
a first switch means connected to energize and deenergize said power supply when actuated and deactuated, respectively,
means mounting said second insulator for movement between an inactive position in which said first switch means is deactuated to de-energize said power supply and an active position in which said first switch means is actuated to energize said power supply, and
a solid state electronic switch connected between said first and second charger electrodes for short-circuiting said first and second charger electrodes when placed in a conductive condition by movement of said second insulator to its inactive position, said solid state electronic switch being nonconductive when said first switch means is actuated and said power supply is energized by movement of said second insulator to its active position,
said charger apparatus being operative to charge said capacitor by first engaging said movable contact and second

electrode of said dosimeter with said first and second electrodes of said charger, respectively, and thereafter when so engaged moving said first dosimeter electrode toward said first switch means to thereby sequentially (a) advance said second insulator toward said first switch means to its active position to actuate said first switch means and energize said power supply to apply a potential between said first and second charger electrodes and render nonconductive said solid state electronic switch, and (b) move said movable contact into contact with said first dosimeter electrode to charge said capacitor from said energized power supply via a first series path including said first charger electrode and said movable contact and first electrode of said dosimeter and a second series path including said second electrodes of said dosimeter and charger,

said charger apparatus being operative upon movement of said first dosimeter electrode away from said first switch means to sequentially (a) disengage said first dosimeter electrode and movable contact while said movable contact and first charger electrode remain engaged and said second charger and dosimeter electrodes remain engaged, (b) deactuate said first switch means to de-energize said power supply and place said solid state electronic switch in its conductive state while said movable contact and first charger electrode are engaged and said second charger and dosimeter electrodes are engaged to short-circuit said movable contact and second dosimeter electrode via said first and second charger electrodes, and (c) disengage said movable contact and second dosimeter electrode from said first and second charger electrodes, respectively.

4,224,523

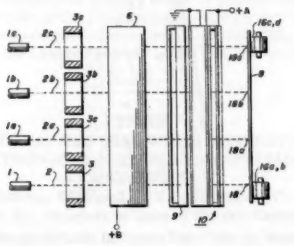
ELECTROSTATIC LENS FOR INK JETS

Peter A. Crean, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1978, Ser. No. 970,305

Int. Cl.³ H01J *37/12*

U.S. Cl. 250—396 R **21 Claims**



1. A cylindrical electrostatic lens for changing the trajectories of charged fluid droplets among a plurality of generally parallel streams of continuously generated discrete droplets of about the same size and velocity when the trajectories of the droplets are above or below a center plane through the lens comprising

upstream and downstream electrodes including means for coupling to a voltage source for establishing upper and lower focusing fields between the electrodes in the paths of a plurality of parallel droplet streams,

the upper and lower fields having a center plane therethrough over which the trajectories of charged drops are not changed and focusing charged droplets following trajectories above and below the center plane and intersecting a rectangle normal to the center plane to a focal line on the center plane.

4,224,524

X-RAY IMAGE INTENSIFYING SCREENS COMPRISING RARE-EARTH OXYHALIDE PHOSPHOR PARTICLES

Andre R. Suys, Hove, and Willy K. Van Landeghem, Sint-Gillis-Waas, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Dec. 19, 1978, Ser. No. 970,999

Claims priority, application United Kingdom, Jan. 16, 1978, 1671/78

Int. Cl.² C01T *1/20*; C09K *11/46*

U.S. Cl. 250—486 **10 Claims**

1. An X-ray image intensifying screen, which includes in a binder layer rare-earth oxyhalide phosphor particles that are in contact or admixed with an inorganic or organic substance or mixture of substances bringing about that the fluorescence power of said oxyhalide phosphor particles is less prone to be reduced by moisture, said substance being a non-phosphor substance or a phosphor substance other than calcium tungstate and producing hydroxyl ions when put in water, wherein the hydroxyl ion production power of said substance is such that when putting said substance in water at 25° C. in an amount of 0.1 equivalent per liter a pH of at least 8.0 is obtained and the solubility in water of said substance is such that at least 0.05 g of said substance is soluble in 100 ml of water at 20° C.

4,224,525

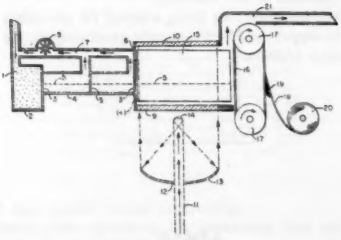
APPARATUS FOR PRODUCING STEREO-REGULAR POLYMERS

David C. Phillips, and Max Garbuny, both of Pittsburgh, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 599,495, Jul. 28, 1975. This application Nov. 6, 1978, Ser. No. 958,235

Int. Cl.² B01K *1/00*

U.S. Cl. 250—531 **12 Claims**



1. An apparatus comprising:

(A) means for producing a moving stream of gaseous unsaturated monomer having an electric dipole moment;

(B) a source of laser light which is nearly monochromatic of a wavelength suitable for activating said monomer, directed at said moving stream of monomer;

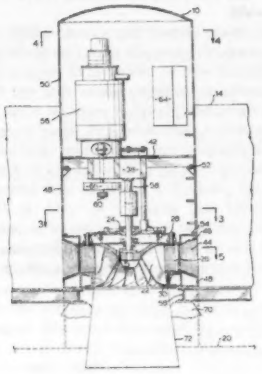
(C) means for producing a direct current electric field across monomer activated by said monochromatic light sufficient to orientate said activated monomer; and

(D) means for collecting said stream after activation and orientation.

4,224,526
PREFABRICATED HYDRO-ELECTRIC GENERATING STATION

Arthur D. Margison, Toronto, and William T. Trick, Clinton, both of Canada, assignors to A. D. Margison Management Ltd., Toronto, Canada

Filed Feb. 6, 1978, Ser. No. 875,428
Int. Cl.³ F03B 3/02
U.S. Cl. 290—52 6 Claims



1. A prefabricated hydro-electric generating station comprising;

a vertical turbine having a Francis runner with its axis of rotation in a vertical direction, a distributor and upper and lower horizontally disposed stayvane rings with stayvanes extending therebetween;

a generator and associated running gear for generating electrical power operatively connected to the Francis runner;

a housing with means for entry by an attendant having walls supported on said upper horizontally disposed stayvane ring of said turbine and enclosing said generator and associated running gear;

said upper horizontally disposed stayvane ring of said turbine underlying said housing, generator and associated running gear and providing vertical, lateral and torsional support for said housing generator and associated running gear mounted in said housing;

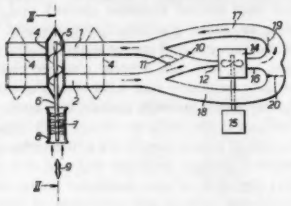
said lower stayvane ring being adapted for mounting on a base to support said hydro-electric generating station in an operative position.

4,224,527
FLUID FLOW INTENSIFIER FOR TIDE, CURRENT OR WIND GENERATOR

Jack E. Thompson, Edgmont, Wood House La., Holbury, St. Mary nr. Dorking, Surrey, England

Filed Jul. 6, 1978, Ser. No. 922,414
Int. Cl.² F03B 13/10
U.S. Cl. 290—54 23 Claims

1. A method of intensifying a fluid flow, comprising the steps of causing a relatively slow speed natural substantially horizontal flow of a natural fluid to turn rotary means about a substantially horizontal axis, causing said rotary means to act directly on a working fluid and force the working fluid through a pipe system without the formation of an elevated head to a flow intensifier in the form of a constriction whereby

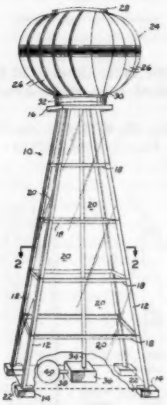


the flow of working fluid is sufficient to drive means for generating electricity.

4,224,528
SOLAR THERMAL AND WIND ENERGY POWER SOURCE

William H. Argo, 132 NW. 23, Oklahoma City, Okla. 73103

Filed May 14, 1979, Ser. No. 39,065
Int. Cl.³ H02P 9/04
U.S. Cl. 290—55 3 Claims



1. A thermal air and wind powered electric current generating system, comprising:

a tower having a plurality of upwardly converging legs and having a centrally open platform secured to the upper end portion of the legs;

a plurality of light admitting wall forming panels enclosing said tower for forming a thermal air passageway, the lowermost edge of the lowermost panels being spaced above the surface of the earth a selected distance;

a thermal air and wind driven turbine mounted on said platform in communication with the interior of said tower, said turbine having a drive shaft projecting downwardly through said platform coextensive with the tower;

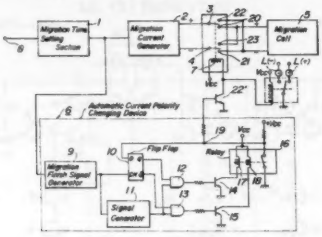
a section of helically wound sheet material extending radially inward from the tower walls substantially coextensive with the tower for inducing a cyclonic action on thermal air moving toward said turbine; and

a generator operatively connected with said drive shaft.

4,224,529
AUTOMATIC POLARITY CHANGING DEVICE

Toshihide Fujiwara, Fuchu, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed May 18, 1978, Ser. No. 907,283
Claims priority, application Japan, May 23, 1977, 52-58866
Int. Cl.[2] H01H *47/00, 43/32*
U.S. Cl. 307—127 **5 Claims**



1. A device for automatically changing the polarity of a direct current supply source for use in a cataphoresis apparatus including a migration time setting section, a migration current generator connected to said section and having two output terminals for delivering migration current of positive and negative polarities and a migration cell connected to the migration current generator, the device comprising a polarity change switch connected between the migration current generator and the migration cell for changing the polarity of migration current, means connected to the migration time setting section for generating a functional signal in response to detection of an instruction signal from the migration setting section, signal processing means connected to the generator for processing the functional signal to finally drive the polarity change switch, and polarity changing and memorizing means connected between ground and the polarity change switch and between said signal processing means and a voltage supply source for instructing polarity change of the migration current to the polarity change switch and for memorizing the changed polarity of the migration current in spite of switching on or off of a power supply source, said polarity changing and memorizing means changing the polarity of the migration current to a polarity opposite to the just previous polarity every detection of the instruction signal from the migration time setting section and holding the changed polarity until a next instruction signal is received.

4,224,530
TIME TO GO AND DIAGNOSTIC DISPLAY FOR ELECTRONIC SEQUENCE TYPE APPLIANCE CONTROLLER

Robert J. Simcoe, Liverpool, N.Y., and Robert C. Helfrich, Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 6, 1978, Ser. No. 913,260
Int. Cl.[2] H01H *1/00*
U.S. Cl. 307—141 **9 Claims**

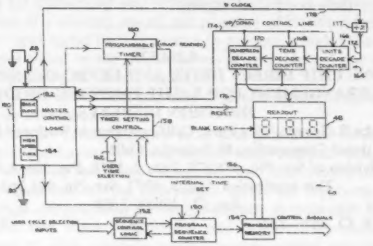
1. An electronic control for cyclically operated apparatus, said control comprising:

a sequence type controller including program memory means and means for accepting user cycle selections, said controller operable for advancing through a selected program in discrete program advancing operations, the total number of program advancing operations required for execution of a program dependent at least in part upon the user cycle selections;

counting and display means operable to count inputted clock pulses and to display a representation of the number thereof, said counting and display means capable of being selectively enabled to count in either of two directions;

means for supplying clock pulses to said counting and display means in correspondence with each program advancing operation; and

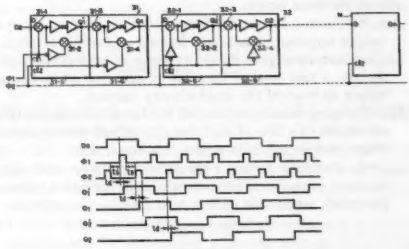
control logic means operable during a normal mode of operation to initially enable said counting and display means to count in one direction and to rapidly execute the entire selected program a first time with relatively shorter intervals between successive program advancing operations, thereby to preset the counting and display means with a representation of the total number of program advancing operations required for execution of the selected program; and to then enable said counting and display means to count in the other direction and to execute the selected program a second time with relatively longer intervals between successive program advancing operations, whereby said counting and display means provides a continuous representation of the remaining time to go during the second execution of the selected program.



4,224,531
DATA TRANSFER CIRCUIT

Heihachiro Ebihara; Fukuo Sekiya, both of Tokorozawa, and Takashi Yamada, Sayama, all of Japan, assignors to Citizen Watch Co., Ltd., Tokyo, Japan

Filed Mar. 6, 1978, Ser. No. 883,867
Claims priority, application Japan, Mar. 11, 1977, 52-26836
Int. Cl.[2] G11C *19/28*
U.S. Cl. 307—221 C **14 Claims**



1. A data transfer circuit comprising:

a timing pulse generator for generating first and second phase displaced clock signals;

a data signal source for sending out a data signal in response to the second clock signal;

a shift register circuit comprising a plurality of stage bits connected in cascade to each other, each stage bit including a master portion and a slave portion each having a clock input, a data input and a data output, the data output of the master portion being connected to the data input of the slave portion wherein the data input of the master portion and the data output of the slave portion form a data input and a data output of each stage bit, respectively;

the data input of the first stage being coupled to the output of the data signal source;

only the master portion of at least the first stage bit being controlled to transfer the data signal in response to the first clock signal and the slave portion of at least the first stage bit being controlled to transfer the data signal in response to the second clock signal; and

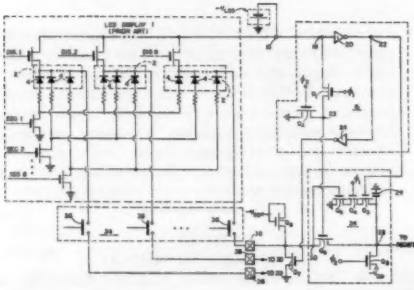
the master and slave portion of the remaining stage bits being controlled to transfer the data signal in response to the second clock signal.

4,224,532

ONE CHIP DIRECT DRIVE AND KEYBOARD SENSING ARRANGEMENT FOR LIGHT EMITTING DIODE AND DIGITRON DISPLAYS

John R. Spence, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 654,678, Feb. 2, 1976, Pat. No. 4,100,460.
This application Aug. 3, 1977, Ser. No. 821,363
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—237 **8 Claims**



1. A circuit to provide an indication of the condition of a switch to be connected to a supply of drive voltage, said circuit including:

source means for providing a plurality of reference potentials,

input terminal means connected to said switch,

output terminal means,

first transistor gate means connected between said input and output terminal means, and having a control terminal,

second transistor gate means to connect said drive voltage supply to said control terminal of said first transistor gate means to control the conductivity thereof,

first clamping means connected to clamp said output terminal means to a first of said plurality of reference potentials when said switch is in a first condition, and

second clamping means connected to clamp said output terminal means to a second of said plurality of reference potentials when said switch is in a second condition.

4,224,533

EDGE TRIGGERED FLIP FLOP WITH MULTIPLE CLOCKED FUNCTIONS

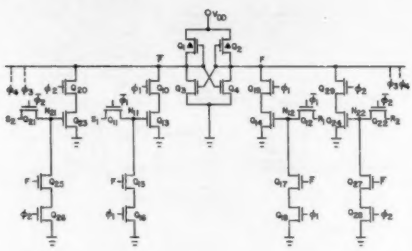
Eric H. Lai, Cupertino, Calif., assignor to Signetics Corporation, Sunnyvale, Calif.

Filed Aug. 7, 1978, Ser. No. 931,596
Int. Cl.² H03K *5/13, 3/353, 17/18, 17/26*
U.S. Cl. 307—247 R **8 Claims**

1. An edge triggered flip flop capable of operating with multiple clocked functions, comprising

(a) a flip flop,

(b) a plurality of trigger circuit means coupled in common with said flip flop and in parallel with each other for controlling said flip flop, each of said trigger circuit means having a clock input responsive to a different clock signal and at least one of a set input and a reset input and coupled to said flip flop so that, during the application of a set signal to said set input, the occurrence of a first low to high logic level transition of a clock signal applied to said clock input will set the flip flop to one state and during the application of a reset signal to said reset input, the occurrence of a second low to high logic level transition of said clock signal will set said flip flop to another state opposite to said one state, and



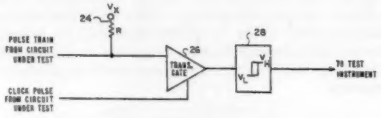
(c) means coupled between said flip flop and each of said trigger circuit means to temporarily disconnect each said trigger circuit means from said flip flop during the time period between two successive low to high logic level transitions of the respective clock signal, whereby said flip flop can be controlled during said time period by coupling another trigger circuit means to said flip flop.

4,224,534

TRI-STATE SIGNAL CONDITIONING METHOD AND CIRCUIT

Gary B. Gordon, Saratoga, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 17, 1977, Ser. No. 825,343
Int. Cl.² H03K *5/08*
U.S. Cl. 307—261 **8 Claims**



1. A method of generating a repeatable binary signal from a tri-state signal to characterize said tri-state signal for testing, both signals having the same preselected clock rate, and said tri-state signal being the output signal of a logic circuit wherein the output signal has a high state region, a low state region, and a floating region, said high and low state regions being defined by the logic circuit when its output stage is clamped to a voltage level that is greater than or less than a first and a second signal threshold level, respectively, and said floating region occurring when the output stage of the logic circuit is unclamped to any voltage level, the method comprising the steps of:

a. limiting the variation of the tri-state signal in the floating regions to a single transition of one of said first and second signal threshold levels;

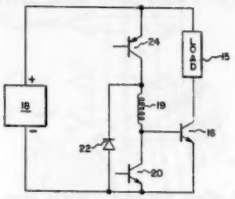
b. sampling the limited tri-state signal of step a. in relation to the preselected clock rate; and

c. identifying the sampled, limited high and low state regions of the tri-state signal as high and low states, respectively, and identifying its regions limited in step a. as being in the same state as the last previous one of the high and low state regions.

4,224,535
EFFICIENT BASE DRIVE CIRCUIT FOR HIGH CURRENT TRANSISTORS

James W. A. Wilson, and Robert L. Steigerwald, both of Scotia, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 8, 1978, Ser. No. 931,907
Int. Cl.[2] H03K 17/60
U.S. Cl. 307—270 7 Claims



1. An efficient base drive circuit for providing base current to a high current transistor from a source of relatively high DC potential, comprising:

inductor means connected to the base of a high current transistor for providing current thereto so as to cause said high current transistor to be conductive during selected time intervals;

switching means connected to the junction of said inductor means and the base of said high current transistor for diverting current away from the base of said high current transistor at other than said selected time intervals so as to cause said high current transistor to be substantially non-conductive during other than said selected time intervals;

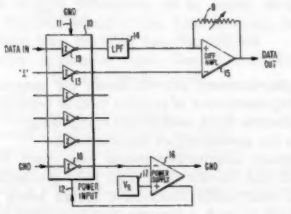
regulator means connected between the DC source potential and said inductor means for controlling current amplitude through said inductor means, said regulator means being switched into and out of conduction at a predetermined ratio of time intervals; and

unidirectional conduction means connected across the series combination of said inductor means and said switching means so as to maintain uninterrupted current flow through said inductor means when said regulator means are switched out of conduction.

4,224,536
STABILIZATION OF MONOLITHIC INTEGRATED CIRCUIT OUTPUT LEVELS

George A. Cutsogeorge, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 24, 1978, Ser. No. 899,594
Int. Cl.[2] H03K 1/02
U.S. Cl. 307—297 4 Claims



1. A circuit for stabilizing the output levels from a plurality of substantially independent circuit means formed on a common substrate comprising, in combination:

monolithic substrate means for carrying said plurality of substantially independent circuit means formed thereon, each circuit means having an input means for receiving input signals and an output means for supplying output signals, each of said plurality of circuit means further having a common first power supply terminal means for providing a voltage return path, and a common second power supply terminal means for receiving a voltage;

reference voltage means for supplying a fixed voltage;

means for connecting said voltage return path to the input means of a selected one of said plurality of circuit means, said input signal having a value to produce a high valued output signal on the output means of said selected one of said plurality of circuit means;

said selected one of said plurality of circuit means comprising an inverter; and

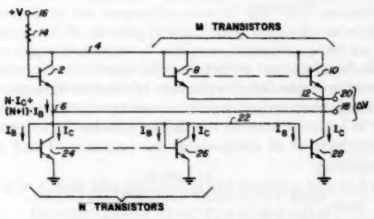
power supply means separate from said plurality of circuit means and having first and second input terminal means for receiving said fixed voltage and said high valued output signal and having first output means for supplying a voltage proportional to the difference in potential between said fixed voltage and said high valued output signal to said common second power supply terminal means;

said power supply means further comprising voltage return means connected to said common first power supply terminal of said plurality of circuit means.

4,224,537
MODIFIED SEMICONDUCTOR TEMPERATURE SENSOR

Marvin A. Glazer, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 16, 1978, Ser. No. 961,308
Int. Cl.[3] H03K 3/26
U.S. Cl. 307—310 6 Claims



1. The temperature sensor circuit for providing an indication of temperature comprising:

(a) a first semiconductor junction having a predetermined junction area for conducting a first current and for generating a first voltage across said first semiconductor junction;

(b) semiconductor junction means for conducting a second current and for generating a second voltage across said semiconductor junction means, said semiconductor junction means having a junction area equal to M times said predetermined junction area, said semiconductor junction means comprising a plurality M of semiconductor junctions coupled in parallel with each other for conducting said second current and for generating said second voltage, each of said plurality M of semiconductor junctions having a predetermined junction area;

(c) first means coupled to said first semiconductor junction and to said semiconductor junction means and being adapted for coupling to a power supply for providing said first and second currents;

(d) second means coupled to said first semiconductor junction and to said semiconductor junction means for maintaining the magnitude of said first current equal to N times the magnitude of said second current, said second means including means coupled to said first means for conduct-

ing a bias current and for generating a bias voltage, a first transistor coupled to said semiconductor junction means for conducting said second current, and transistor means coupled to such first semiconductor junction for conducting said first current, said first transistor and said transistor means each being responsive to the bias voltage for regulating said first and second current, respectively; and

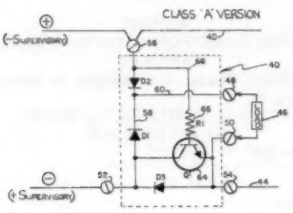
(e) output means coupled to said first semiconductor junction for receiving said first voltage and coupled to said semiconductor junction means for receiving said second voltage, said output means providing a differential output voltage having a magnitude which is linearally proportional to temperature.

4,224,538

SERIES SUPERVISION/PARALLEL ACTUATION DEVICE

John M. Cholin, Hackensack, N.J., assignor to Firetek Corporation, Hawthorne, N.J.

Filed Sep. 15, 1978, Ser. No. 942,541
Int. Cl.[2] H03K *17/74;* **H02H** *3/00*
U.S. Cl. 307—317 R **2 Claims**



1. An electronic switch for the supervision in series and actuation in parallel of a plurality of electrically actuated mechanical, electro-mechanical and electro-chemical devices for use in a circuit loop in which line polarity is reversed upon recognition of an alarm signal for actuation of said devices comprising:

a first and a second line connecting said switch to a circuit loop;

a load connected to said switch;

a plurality of diodes within said switch to direct current to the load;

a first and a second of said diodes being connected in series between the two lines of said circuit such that one of said diodes is reverse-biased with respect to the other;

a junction between said first and second diodes connected to the first side of said load;

a third diode connected in the second line of said circuit;

said third diode being reverse-biased with respect to a positive current on said second line;

said diodes being positioned such that in a supervisory mode a positive current from the second line of said circuit flows through said first diode, is blocked by said second and third diodes, flows through said load and returns to said positive line to flow in series in the next switch and load, thus supervising the electrical continuity of said circuit loop and the loads on said loop;

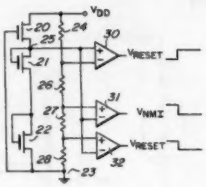
said diodes being positioned such that upon polarity reversal in an actuation mode a positive current flows through the second of said diodes, is blocked by the first of said diodes flows through said load at full terminal voltage and then to and through the second line of said circuit including said third diode which is now forward-biased, thus actuating all of said loads in said circuit loop in parallel.

4,224,539

FET VOLTAGE LEVEL DETECTING CIRCUIT

Fuad H. Musa, and Pern Shaw, both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 5, 1978, Ser. No. 939,725
Int. Cl.[2] H03K *5/20, 17/30, 1/12*
U.S. Cl. 307—362 **11 Claims**



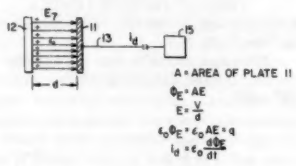
1. A field effect transistor voltage level detecting circuit comprising: a depletion type transistor having a first and a second electrode and a control electrode, the first electrode being coupled to a first voltage terminal and the control electrode being coupled to a second voltage terminal; a first enhancement type transistor having a first and a second electrode and a control electrode, the first electrode of the first enhancement type transistor being coupled to the second electrode of the depletion type transistor, the control electrode of the first enhancement type transistor being coupled to the first electrode of the first enhancement type transistor; a second enhancement type transistor having a first electrode and a control electrode coupled together to the second electrode of the first enhancement type transistor and having a second electrode coupled to the second voltage terminal; a plurality of resistances connected in series to form a voltage divider network; and at least one comparator having a first and a second input and an output, the first input being coupled to the second electrode of the depletion type transistor and the second input being coupled to the voltage divider network.

4,224,540

DISPLACEMENT CURRENT SENSOR

Shigeo Okubo, 5412 N. Nevada, Colorado Springs, Colo. 80907

Filed Aug. 10, 1978, Ser. No. 932,582
Int. Cl.[2] G01B *7/00;* **G11C** *13/02*
U.S. Cl. 307—400 **21 Claims**



1. A displacement current sensor for generating electrical signals representative of relative motion between a conductor and an electric field, said sensor comprising:

means for generating an electric field;

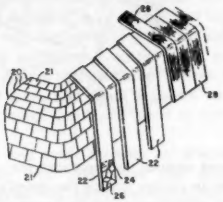
electrically conductive means positioned for interaction with said electric field, said field generating means and said electrically conductive means being relatively arranged in such a manner that variations in the field encountered by said electrically conductive means induce a displacement current in said electrically conductive means; and

single electrically conductive output terminal means coupled to said electrically conductive means for manifesting said displacement current.

4,224,541
FLUID SOLVENTLESS EPOXY-ANHYDRIDE COMPOSITIONS CONTAINING METAL ACETYLACETONATE ACCELERATORS AND ORGANIC CARBOXYLIC ACID CO-ACCELERATORS FOR USE ON AN ELECTRICAL MEMBER

James D. B. Smith, Wilkins Township, Allegheny County, and Robert N. Kauffman, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 773,875, Mar. 3, 1977, Pat. No. 4,113,791.
This application May 26, 1978, Ser. No. 909,749
Int. Cl.[3] H02K *15/12*; H01H *85/02*; B32B *5/16*; B05D *5/12*
U.S. Cl. 310—45 10 Claims



1. An insulated high voltage electrical apparatus, comprising a metal stator having slots therein, conducting electrical coil windings disposed within the slots of the stator, and a body of cured resinous insulation applied to and completely impregnating the electrical coil windings, the insulation comprising a cured resinous composition, consisting essentially of the admixture of:

(1) an epoxy resin,

(2) an anhydride reactive with the epoxy resin,

(3) from about 0.01 part to about 2.0 parts by weight per 100 parts by weight of epoxy resin, of a metal acetylacetonate selected from the group consisting of chromium (III) acetylacetonate, zirconium (IV) acetylacetonate, and mixtures thereof, acting as a latent accelerator, and

(4) from about 0.3 to about 30 parts by weight per 100 parts by weight of epoxy resin, of an organic carboxylic acid selected from the group consisting of acetic acid, propionic acid, butyric acid, isobutyric acid, valeric acid, caproic acid, heptanoic acid, caprylic acid, benzoic acid, toluic acids, chlorobenzoic acids, nitrobenzoic acids, succinic acid, glutaric acid, adipic acid, pimelic acid, suberic acid, azelaic acid, sebacic acid, phthalic acid, isophthalic acid, terephthalic acid and mixtures thereof, functioning as a co-accelerator with the acetylacetanate.

4,224,542
SMALL-SIZED MOTOR WITH CENTRIFUGAL GOVERNOR SWITCH

Masatoshi Kawano, Katano; Tsutomu Hashimoto, Shijonawate, and Miyuki Furuya, Neyagawa, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 10, 1977, Ser. No. 850,148
Claims priority, application Japan, Dec. 21, 1976, 51-172085
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—68 E 2 Claims

1. A small-sized motor comprising:

a casing having a pair of opposed bearings;

a ring-shaped stator having a circular space;

a rotor rotatably disposed in said circular space in said stator;

a shaft which is journalled by said bearings said rotor being mounted on said shaft;

a commutator having a specified number of metal segments; said commutator being mounted on said shaft;

a plurality of rotor coils wound in said rotor and connected by the ends thereof to said metal segments;

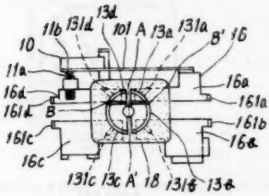
a centrifugal governor switch having a fixed contact and a moving contact connected to corresponding ends of said rotor coils;

characterized in that:

said centrifugal governor switch is disposed around said shaft and adjoins said commutator axially on the same side with respect to said rotor, axially adjoining the rotor and stator;

a corresponding said specified number of connecting plates are connected each to a respective said metal segment;

a molding of insulating plastic resin is provided and embeds a portion of each of said connecting plates and a portion of each of said metal segments therein, including where each metal segment is connected to a respective connecting plate, but not including a respective connecting tip of each connecting plate, these connecting tips remaining exposed, said rotor coil ends being attached to respective ones of said metal segments via respective ones of said connecting tips;



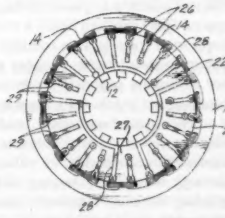
said molding thus mechanically uniting all of said metal segments and all of said connecting plates in a common body, said molding being mounted on said shaft; and

said moving contact and said fixed contact of said centrifugal governor switch are secured to a respective two ones of said connecting plates, the fixed contact being directly secured to the respective one of said two connecting plates and the moving contact being indirectly secured to the respective other of said two connecting plate via the intermediacy of an elongated moving contact plate which is secured at one end thereof to said other connecting plate, said moving contact being provided on an opposite, free end of said moving contact plate.

4,224,543
PRINTED CIRCUIT TERMINAL FOR INTERCONNECTING STATOR COILS

Anthony P. Morreale, Whittier, Calif., assignor to Rapidsyn Co., Santa Fe Springs, Calif.

Filed Aug. 1, 1978, Ser. No. 929,909
Int. Cl.[2] H02K *11/00*
U.S. Cl. 310—71 2 Claims



1. In a motor stator having a cylindrical core of magnetic material defining a plurality of radial poles on which are wound coils of conductive wire, apparatus for interconnecting the coils and connecting external electrical leads to the coils comprising: an annular printed circuit board having a plurality

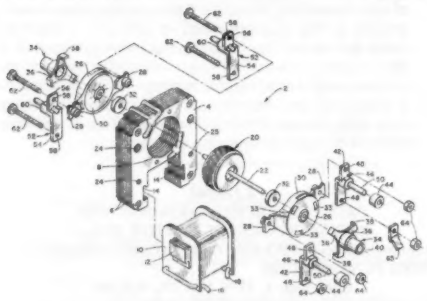
of radial notches around the outer periphery, the notches being V-shaped and having an enlarged round opening at the inner converging end of the V-shaped portion of the notches, a portion of the printed circuit forming a plurality of conductive terminals on the surface of the board, with one conductive terminal being adjacent each notch, there being two terminals and associated notches for each coil, adhesive means holding the circuit board against the coils adjacent one end of the core and coaxial with the core, each coil having a portion of the wire wedged into the enlarged openings in said notches and electrically connected to the associated conductive terminals, the wedged wire of the coil anchoring the board against the coils, and a plurality of external electrical leads connected to selected ones of said terminals, the printed circuit board electrically interconnecting the external leads and the coils.

4,224,544

FAN MOTOR HAVING REVERSIBLE ROTOR

Eugene T. McKinnon, 16536 Chattanooga Pl., Pacific Palisades, Calif. 90272; Alvin S. Drutz, 11613 Clover Ave., Los Angeles, Calif. 90066; James B. Nelson, deceased, late of Fullerton, Calif., and Lorraine Nelson, executrix, 1118 E. Glenwood, Fullerton, Calif. 92631

Filed Oct. 5, 1978, Ser. No. 948,866
Int. Cl.[3] H02K *5/16*
U.S. Cl. 310—90 **10 Claims**



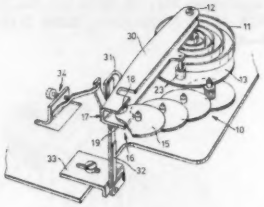
1. An electric motor of the refrigerator fan-type having a stator of a plurality of plates, said plates having a pair of at least two, aligned, spaced apart through holes; a releasably disposed rotor module supported for selective rotation within said stator; a bearing encompassing bracket member disposed on each side of said rotor module in supportive relationship therewith and electric motor support brackets for supporting said electric motor disposed on each side of said stator, said bearing bracket members and electric motor support brackets being releasably retained in cooperative relationship by retaining means disposed in said through holes and retaining said members, said bearing-encompassing bracket members having an interior recess for carrying a source of lubricant and a bearing member in juxtaposition therewith for supporting the shaft of said rotor module, said bearing-encompassing bracket members having radially spaced slots adapted to receive a grommet mounting member having a Y-configuration with a central protuberance, with friction-retaining legs, snap-fitted into said radially spaced slots in releasable friction-retaining fashion.

4,224,545

SPEED CONTROL

Brian W. Powell, Ashton-under-Lyne, England, assignor to Ferranti Limited, Hollinwood, England

Filed Aug. 2, 1978, Ser. No. 930,220
Claims priority, application United Kingdom, Aug. 27, 1977, 36107/77
Int. Cl.[2] H02K *49/02*
U.S. Cl. 310—93 **12 Claims**



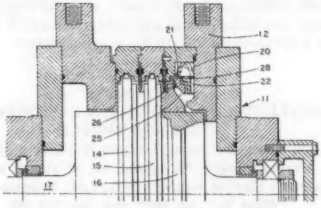
1. A speed control arrangement for a rotatable member driven from an energy source the speed control arrangement including an eddy current brake comprising a rotor of electrically conductive material coupled to the rotatable member to be driven therewith, a magnetic circuit including a magnet and arranged to be coupled to the rotor such that rotation of the rotor causes eddy currents to be induced in the rotor material to produce a braking torque against its rotation and actuation means responsive to a change in driving torque applied to the rotatable member by the energy source to alter the coupling between the magnetic circuit and the rotor to produce a change in the braking torque on the rotor corresponding to the change in driving torque.

4,224,546

PURIFICATION OF LIQUID METAL CURRENT COLLECTORS

Burton D. Hatch, Ballston Lake, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 24, 1978, Ser. No. 909,311
Int. Cl.[3] H02K *31/00*
U.S. Cl. 310—178 **1 Claim**



1. In an acyclic machine which uses liquid metal for current collection and includes a rotor, a stator, and a plurality of collector regions formed by a liquid plurality of rotor collector rings rotatable within respective stator collector rings, improved means for removing gas and impurities from the liquid metal comprising:

means in said stator collector rings for insulating each stator collector ring from the adjacent stator collector ring; and

a plurality of plugs inserted at spaced intervals along the inner surface of the end one of said stator collector rings, said plugs each having a groove for conducting liquid metal which includes an inlet tangent to said surface and

aligned against the direction of rotation of the adjacent rotor collector ring at the end of said collector regions so that liquid metal is forced thereinto, and a radial passage remote from said inlet for directing said liquid metal radially inward,

said end stator collector ring having a radial groove which is in register with said radial passages and an interior annular stator groove at the terminus of said radial groove for receiving and collecting liquid metal that is forced into said inlets by centrifugal force imparted by said adjacent rotor collector ring,

the end one of said rotor collector rings having an annular groove communicating with said stator annular groove and angled radially outward therefrom for receiving and collecting degassed and de-emulsified liquid metal,

said end rotor ring further having spaced substantially radial passages extending from the outer end of said rotor annular groove to the adjacent collector region at points remote from said inlets and said stator radial passages for resupplying liquid metal to said collector region,

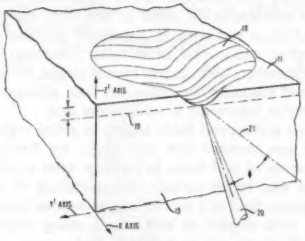
said stator and said rotor forming an interior passage communicating with said stator and rotor annular grooves for removing gases and impurities separated from said liquid metal by centrifugal force.

4,224,547

ADJUSTING THE FREQUENCY OF PIEZOELECTRIC CRYSTAL DEVICES VIA FRACTURING THE CRYSTAL SURFACE

Anton J. Miller, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 28, 1979, Ser. No. 16,114
Int. Cl.[3] H01L *41/08, 41/22*
U.S. Cl. 310—312 **21 Claims**



1. In a method for fabricating piezoelectric devices, a method for adjusting the resonant frequency of a single crystal piezoelectric plate (**10**) having major (**12,13**) and minor (**11**) surfaces comprising the step of removing a selected amount of material from said plate, CHARACTERIZED IN THAT material is removed in the form of a localized chip by fracturing the crystal near the edge between the major and minor surfaces.

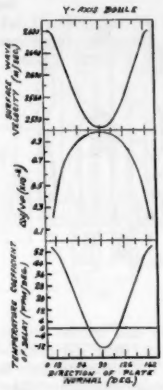
4,224,548

SINGLY ROTATED CUT OF Y-AXIS BOULE LEAD POTASSIUM NIOBATE, $PB_2KNB_5O_{15}$, FOR SURFACE ACOUSTIC WAVE APPLICATIONS

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 31, 1979, Ser. No. 43,984
Int. Cl.[2] H01L *41/18*
U.S. Cl. 310—360 **1 Claim**

1. A lead potassium niobate crystalline substrate member particularly adapted for use in surface acoustic wave device which is characterized by having an acoustic wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda=90.0°, Mu=66.6 and Theta=0.0°.

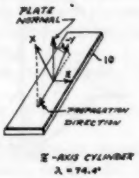


4,224,549

LEAD POTASSIUM NIOBATE SUBSTRATE MEMBER FOR SURFACE ACOUSTIC WAVE APPLICATIONS

Robert M. O'Connell, Arlington, Mass., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed May 31, 1979, Ser. No. 43,985
Int. Cl.[2] H01L *41/18*
U.S. Cl. 310—360 **1 Claim**



1. A lead potassium niobate crystalline substrate member particularly adapted for use in surface acoustic wave device which is characterized by having an acoustic wave propagation surface defined by a plane that substantially coincides with the Euler angles Lambda=74.4°, Mu=90.0° and Theta=0.0°.

4,224,550

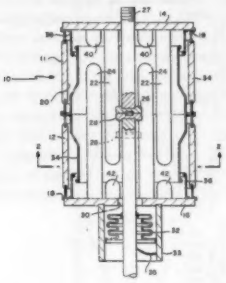
VACUUM DISCHARGE DEVICE WITH ROD ELECTRODE ARRAY

Joseph A. Rich, Schenectady, N.Y., assignor to Electric Power Research Institute, Inc., Palo Alto, Calif.

Filed Feb. 23, 1979, Ser. No. 14,352
Int. Cl.[2] H01H *33/66;* H01J *21/22*
U.S. Cl. 313—146 **8 Claims**

1. A vacuum device comprising: a sealed enclosure having an evacuated chamber therein, first and second conductive plates at opposite ends of said chamber, a plurality of first rod electrodes supported from said first conductive plate and a plurality of second rod electrodes supported from said second conductive plate within said chamber, said first and second rod electrodes extending into spaced side by side relation to provide arcing surfaces, means for initiating arcing between said first and second rod electrodes, and a plurality of conductive

protuberances on the interior surface of said first and second conductive plates, said protuberances on said first conductive plate being aligned axially with said second rod electrodes and



said protuberances on said second conductive plate being aligned axially with said first rod electrodes whereby said protuberances define the dielectric gaps between each said electrode and the opposite conductive plate.

4,224,551

VEHICLE HEADLIGHT WITH A DIRT SENSOR

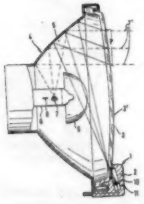
Klaus Liebegott, Munich, Fed. Rep. of Germany, assignor to Bayerische Motoren Werke Aktiengesellschaft, Fed. Rep. of Germany

Filed Apr. 23, 1979, Ser. No. 32,344

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2818019

Int. Cl.[2] F21V *33/00;* **B60Q** *11/00*

U.S. Cl. 313—323 **7 Claims**



1. In a vehicle headlight comprising dirt sensor means for sensing dirt on a diffuser disk of said headlight, said dirt sensor means receiving the light of a lamp of said headlight scattered back due to dirt on the diffuser disk and being shielded against the light emanating directly from said lamp and emanating indirectly via a reflector wherein the improvement comprises said dirt sensor means is arranged at a point outside of the reflector to which the scattered-back light passes via reflection on the reflector.

4,224,552

MAGNETIC FINE DEFLECTION SYSTEM COMPRISING SHEET CONDUCTORS

Harold G. Parks, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1978, Ser. No. 974,655

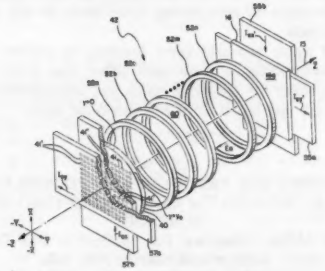
Int. Cl.[2] H01J *29/64, 29/66*

U.S. Cl. 313—431 **7 Claims**

1. Improved magnetic fine deflection apparatus for an electron optical system of the type having a matrix lens member positioned substantially transverse to a system axis and having an array of a plurality of apertures formed therethrough, means for emitting a beam of electrons toward said matrix lens member, coarse deflector means for deflecting the electron beam through a selected one of the plurality of apertures toward the surface of a target positioned transverse to said system axis and beyond said lens member with respect to said source means, and means for focusing the beam upon said target surface after passage of said beam through said selected aperture, said fine deflection apparatus comprising:

first means comprising first and second orthogonally-disposed sheet conductors, each lying in a plane substantially transverse to said system axis, and positioned beyond said target, with respect to said lens member, for generating a first magnetic fine deflection field substantially in a direction transverse to said system axis; and

second means comprising third and fourth sheet conductors orthogonally-disposed in a plane substantially transverse to said system axis; said first and third sheet conductors extending substantially parallel to one another; said second and fourth sheet conductors extending substantially



parallel to one another; each of said third and fourth sheet conductors having an array of apertures formed therethrough with each aperture in registration with an associated aperture in the other of said third and fourth sheet conductors and with an associated aperture of said lens member; said second means being positioned beyond said lens member, with respect to said target, for generating a second magnetic fine deflection field substantially in said direction transverse to said system axis;

said first and second fields adding in a first region between said lens member and said target for finely deflecting electrons of said beam to impinge upon a selected point upon said target surface; the magnitude of said second magnetic field in a second region beyond said lens member, with respect to said target, being reduced by the magnitude of said first field in said second region to reduce errors in the deflection of said beam to said selected aperture by said coarse deflector means.

4,224,553

GAS DISCHARGE INDICATOR DEVICE

Wolfgang Hellwig, Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1978, Ser. No. 949,553

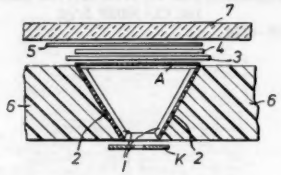
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1977, 2745101

Int. Cl.[2] H01J *61/42*

U.S. Cl. 313—489 **4 Claims**

1. In a gas discharge indicator device including a discharge chamber having two opposed generally parallel sides and provided with an anode and a cathode between which is produced a gas discharge producing UV radiation, the discharge chamber being provided with a coating of light emitting material which emits visible light in response to the emitted UV radiation, and a light transmitting panel which delimits the discharge chamber at least on one side, and through which the

visible light is observable, the improvement comprising means disposed on surfaces laterally delimiting said discharge chamber for reflecting UV radiation and absorbing visible light and means extending adjacent said panel and located between said panel and said coating for reflecting UV radiation and transmitting visible light, in order to increase the proportion of emitted UV radiation conducted onto the coating of light emitting material, said coating being located between said means extending adjacent said panel and the interior of said chamber.



4,224,554

SPARK PLUG HAVING A LOW NOISE LEVEL

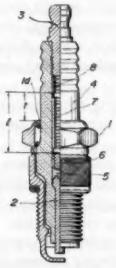
Kanemitsu Nishio, Komaki; Shunichi Takagi, Tajimi, and Mitsutaka Yoshida, Chita, all of Japan, assignors to NGK Spark Plug Co., Ltd., Nagoya, Japan

Filed May 14, 1979, Ser. No. 38,772

Claims priority, application Japan, May 20, 1978, 53-60447; Nov. 24, 1978, 53-145691

Int. Cl.[2] H01T *13/40*

U.S. Cl. 315—53 **4 Claims**



1. In a spark plug having a low noise level, comprising a ceramic insulator having a bore, a metal fitting surrounding the insulator, a center electrode, a terminal electrode and a noise-attenuation element arranged in the bore of the insulator and sealed to the center and terminal electrodes through glass, an improvement comprising said noise-attenuation element consisting of an inductance component alone or a combination of an inductance component with a resistance component, and said inductance component being arranged extending to both sides of a sealed level for the noise-attenuation element formed by an end of the metal fitting which is connected to the insulator.

4,224,555

ELECTRONIC FLASH WITH AUTOMATIC DURATION CONTROL

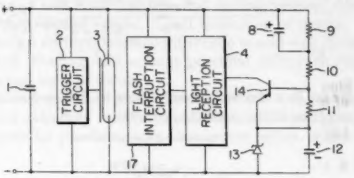
Katsuji Ishikawa, Osaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed Jul. 12, 1978, Ser. No. 923,963

Claims priority, application Japan, Jul. 18, 1977, 52-86363

Int. Cl.[3] H05B *41/32*

U.S. Cl. 315—151 **2 Claims**



1. An electronic flash, comprising:

(a) a flash duration control circuit for interrupting the flashing of a flash lamp, said flash duration control circuit being actuated when the amount of light emitted by said flash lamp due to the discharge of electrical energy stored in a main flash capacitor initiated by the impression of a trigger voltage upon said flash lamp by a trigger circuit and reflected back from a subject and intercepted by a light reception circuit reaches a predetermined level,

(b) a DC power source for supplying a desired constant voltage,

(c) a switching means having two main electrodes and a control electrode for connecting said DC power source to said light reception circuit, and

(d) a voltage generating circuit actuable in response to the flashing of said flash lamp and including a voltage divider for provding an enable voltage to said control electrode to cause said switching means to connect said DC power source to said light reception circuit, said voltage generating circuit comprising:

(a) a parallel circuit consisting of a first resistor and a capacitor,

(b) a second resistor connected in series with said parallel circuit, and

(c) a constant voltage element connected in series with said second resistor, so that the voltage across said second resistor is applied to the control electrode of said switching means.

4,224,556

DRIVE CIRCUIT FOR ELECTROSTATIC DEFLECTION TYPE CATHODE-RAY TUBE

Yasuhiko Muto, Tokyo, Japan, assignor to Trio Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 12, 1979, Ser. No. 11,643

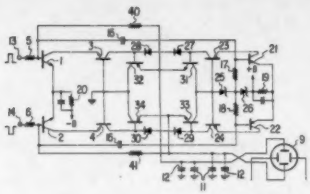
Claims priority, application Japan, Feb. 24, 1978, 53-22355

Int. Cl.[3] H01J *29/74*

U.S. Cl. 315—396 **13 Claims**

2. In a drive circuit for an electrostatic deflection type cathode-ray tube where the drive circuit comprises first and second amplifiers connected in push-pull relationship and first and

second loads respectively connected thereto, the improvement of first and second emitter followers for respectively connecting said first and second amplifiers to first and second deflection plates of the cathode-ray tube.

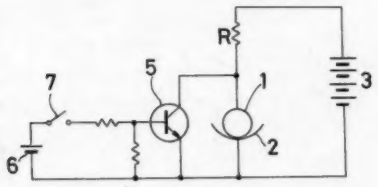


4,224,557

CONTROLLING UNIT FOR A.C. DRIVING AN ELECTROSTATIC DEVICE

Yasuo Sasaki, Kobe, Japan, assignor to Displaytek Corporation of Sanko and Daiwa Shinku Corporation, both of, Japan

Filed Jul. 10, 1978, Ser. No. 923,408
Claims priority, application Japan, Jul. 13, 1977, 52/84385
Int. Cl.[2] H02N *1/00*
U.S. Cl. 318—116 **4 Claims**



1. A controlling unit for driving an electrostatic device from an a.c. power source, the electrostatic device having a fixed electrode, a resilient flexible sheet electrode and a dielectric layer disposed between the fixed electrode and the sheet electrode, the resiliency of the sheet electrode normally drawing the sheet electrode away from the fixed electrode and the application of a voltage across the electrodes causing the sheet electrode to be drawn toward the fixed electrode, said controlling unit comprising:

a resistor connected in series with the electrostatic device and the a.c. power source;

a triode thyristor switching device having a first terminal connected to the fixed terminal of the electrostatic device and a second terminal connected to the sheet terminal of the electrostatic device for conducting a current between said first and second terminals up to a predetermined rated current, said triode thyristor switching device further having a gate terminal for controlling said current conducted between said first and second terminals; and

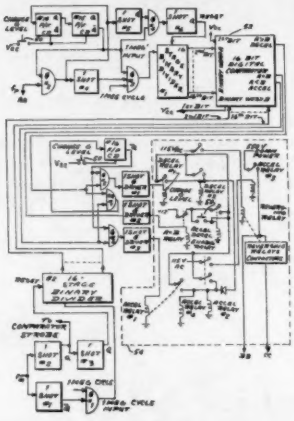
a switching means connected to said gate terminal of said trode thyristor switching device for selectively applying a gate signal to said gate terminal, said gate signal having a magnitude for causing said current conducted between said first and second terminals of said triode thyristor switching device to be in the leakage region, said current being less than or equal to a few hundredths of said rated current, whereby the sheet electrode is drawn away from the fixed electrode when said gate signal is applied to said gate terminal and the sheet electrode is drawn toward the fixed electrode when said gate signal is not applied to said gate terminal.

4,224,558

SELECTABLE SERVO RATIO AND DUAL SPEED CONTROL SYSTEM FOR LARGE CENTRIFUGE UNITS

Wilbur L. Hays, Alamogordo, N. Mex., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Continuation-in-part of Ser. No. 621,327, Oct. 10, 1975. This application Jan. 10, 1978, Ser. No. 868,354
Int. Cl.[2] H02P *5/16*
U.S. Cl. 318—314 **1 Claim**



1. In a large centrifuge unit having a variable RPM arm and a main arm frequency signal fm the improvement comprising,

a frequency synthesizer generating a precision frequency signal fp adapted to effect a selected centrifuge main arm RPM,

digital means for digitizing the precision frequency signal fp and the centrifuge main arm frequency signal fm and for generating an acceleration signal and a deceleration signal in response to relative values thereof, said acceleration and deceleration signals effecting control of the centrifuge main arm RPM,

summing means receiving the precision frequency signal fp from said frequency synthesizer and outputting a current control signal,

a servo ratio selector circuit connected between said frequency synthesizer and said summing means and generating servo control signals, said servo control signals effecting selected operating mode ratios,

a power supply means to drive the centrifuge main arm, said power supply means being current controlled, said power supply means receiving said current control signal from said summing means and providing an output current signal in response thereto, said output current signal driving said centrifuge main arm at a corresponding RPM,

a track and hold circuit connected between said summing means and said power supply means,

a digital tachometer receiving said precision frequency signal fp, said digital tachometer converting said precision frequency signal fp to a velocity signal, and

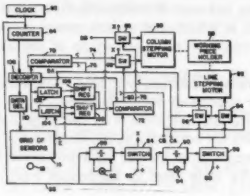
an analog function module connected to said digital tachometer to receive said velocity signal, said analog function module providing an analog voltage proportioned to said velocity signal, said analog function module being connected to said summing means.

4,224,559

REMOTE POSITION CONTROL METHOD AND MEANS

C. Fredrick Miller, 2165 N. Glassell, Orange, Calif. 92667

Filed May 12, 1978, Ser. No. 905,130
Int. Cl.[3] G05B 19/29
U.S. Cl. 318—601 17 Claims



1. The method of changing the relative position of two relatively movable elements from an unspecified initial position in response to movement of a detectible element over a set of coordinates formed by detector elements arranged in a pattern of lines in each of two directions which method comprises the steps of:

(a) displacing the detectible element relative to the coordinate set;

(b) detecting the degree of displacement and the direction of displacement of the detectible element relative to the coordinate set;

(c) moving said movable elements from said unspecified initial position relative to one another in the direction of displacement detected through a distance proportional to the degree of displacement detected.

3. The method of controlling the relative position of a work piece and a bonding tool in a bonding machine which includes a motive means for moving a movable one of the work piece and tool in each of two mutually perpendicular directions by moving a sensor activator relative to a coordinate system formed of lines and columns of sensors which method comprises the steps of:

(a) observing the initial position of the movable one of said work piece and tool relative to the other;

(b) moving the sensor activator to a position in which its position is sensed by said sensor;

(c) moving the sensor activator in a direction corresponding to the direction in which said movable one of said work piece and tool must be moved to accomplish positioning them in a given second relative position;

(d) causing the motive means to move said movable one of the work piece and tool in a predetermined degree in one of said two directions when the sensor activator first causes activation of a sensor of a line after previously having caused activation of a sensor of an adjacent line; and

(e) causing the motive means to move said movable one of the work piece and tool when the sensor activator first causes activation of a sensor of a column after previously having caused activation of a sensor in an adjacent column.

4,224,560

METHOD FOR CONTROLLING PARISON WALL THICKNESS AND A WALL THICKNESS CONTROL SIGNAL GENERATOR CIRCUIT FOR CARRYING OUT THE METHOD

Hiroshi Uekusa, Chiba, Japan, assignor to Yoshino Kogyosho Co., Ltd., Tokyo, Japan

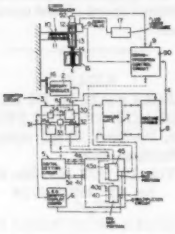
Filed Jul. 14, 1977, Ser. No. 815,766
Claims priority, application Japan, Jul. 23, 1976, 51-87990
Int. Cl.[2] G05B 19/29
U.S. Cl. 318—603 6 Claims

1. A method for controlling a parison wall thickness in which a parison of predetermined length is divided into an equally spaced first set of points along said length and control voltages are assigned to said first set of points for moving a control pin relative to an extrusion outlet of an extruding machine in response to said control voltages, comprising the steps of:

(a) dividing said wall thickness into an equally spaced second set of points having a one-to-one correspondence to said first set of points and assigning preset numbers, representative of said wall thickness and for establishing relative preset voltage values, to said second set of points;

(b) assigning a voltage potential difference to said wall thickness, and dividing said voltage potential difference into m/n actual voltage values;

(c) generating m basic pulses in mechanical synchronism with said extruding machine and feeding said basic pulses into means for providing m/n changeover pulses, m count



pulses, m/2n odd timing pulses, and m/2n even timing pulses offset by a half-period with respect to said odd timing pulses;

(d) feeding said timing pulses and said relative preset voltage values to a multiplexer means for releasing odd and even multiplexed preset voltage values under the control of said odd and even timing pulses;

(e) feeding alternate odd and even multiplexed preset voltage values to said equally divided voltage potential difference and gating odd and even actual voltage values, according to said odd and even multiplexed preset voltage values, into a voltage stepping means for providing a stepped control voltage in timed relation with said count pulses;

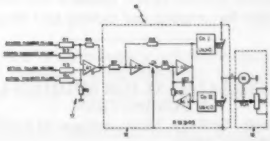
(f) moving said control pin through said servomechanism by means of said control voltage.

4,224,561

METHOD AND APPARATUS FOR REGULATING THE SPEED OF A CONVEYOR

Herbert Handte, Filderstadt, Fed. Rep. of Germany, assignor to Moog GmbH, Boblingen, Fed. Rep. of Germany

Filed Mar. 16, 1979, Ser. No. 21,151
Claims priority, application Fed. Rep. of Germany, Mar. 28, 1978, 2813241
Int. Cl.[3] G05B 1/06; B29F 3/00
U.S. Cl. 318—663 12 Claims



1. In apparatus having a rotatable conveyor, a variable-speed motor operatively arranged to rotate said conveyor, and a variable-volume chamber defined by a piston slidably mounted in a cylinder, wherein said conveyor is arranged to supply

material to said chamber, and wherein said piston is arranged to be moved in one direction to permit filling of said chamber and moved in the opposite direction to discharge material from said chamber, the improved method which comprises the steps of:

generating a first signal indicating the desired degree of filling of said chamber;

generating a second signal indicating the desired volume of material to be discharged from said chamber;

generating a third signal indicating the actual volume of material supplied to said chamber;

generating a fourth signal indicating the actual degree of filling of said chamber;

producing a sum signal, S, according to the equation:

S=K [fourth signal−first signal+third signal−second signal]

where K is a constant; and

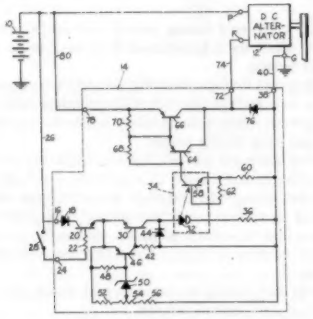
varying the rotational speed of said conveyor in response to said sum signal.

4,224,562

VOLTAGE REGULATOR WITH ELECTRICALLY ISOLATED OUTPUT STAGE

Ralph E. Scheidler, Portland, Oreg., assignor to Sure Power Products, Inc., Portland, Oreg.

Filed Feb. 27, 1978, Ser. No. 881,397
Int. Cl.³ H02P 9/26
U.S. Cl. 322—26 **15 Claims**



1. A voltage regulator for electric generating means providing a direct current output, comprising:

(a) a voltage regulation electric circuit stage having a regulated output and a direct current input adapted for connection to the direct current output of the generating means,

(b) an output electric circuit stage adapted for connection at one end to the field windings of the generating means and at the opposite end to a source of direct current, and

(c) an optic coupler having an electrically actuated light source connected to the output of the regulation stage and light actuated electric switch means in the output electric circuit stage for opening and closing said circuit.

4,224,563

REGULATOR CIRCUIT FOR PHOTOGRAPHIC ILLUMINATION

Herbert L. Hardy, Sudbury, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Sep. 1, 1978, Ser. No. 938,767
Int. Cl.² G05F 1/60
U.S. Cl. 323—225 C **9 Claims**

1. A circuit for regulating an alternating input voltage source of the type subject to relatively wide variations in amplitude and in frequency to provide an energizing current to a load at a select power level, said regulating circuit comprising:

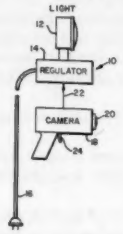
a pair of input terminals for connection to the source of alternating input voltage;

a pair of output terminals for connection to a load;

first switch means in series connection electrically with said output load terminals between said input terminals for switching between a nonconductive state and a conductive state in which said switch means carries current during a portion of each half-cycle of the alternating input voltage;

control means connected with said switch means and actuatable for selectively switching said switch means from its said nonconductive state is its said conductive state;

timing means for actuating said control means to switch said switch means from its said nonconductive state to its said conductive state after an adjustable time interval within



each half-cycle of alternating input voltage wherein said timing means includes a timing capacitor and means for charging said timing capacitor;

first regulating means of a feed-forward type in electrical connection with said timing means and with said control means for adjusting said time interval in response to variations in the input voltage wherein said first regulating means includes second switch means connected with said timing capacitor for actuating said control means only in response to a voltage arising across said timing capacitor having a select value relative to the amplitude of the input voltage; and

second regulating means of the feedback type in electrical connection with said timing means and with the voltage developed across said output terminals for adjusting said time interval in response to variations in the mean square of the voltage developed across said output terminals.

4,224,564

STATISTICAL ENHANCEMENT OF THE ACCURACY OF A RATIO-MATCHED NETWORK IN A CIRCUIT CHIP

Robert C. Dobkin, Hillsborough; James B. Cecil, Santa Clara, and Joseph J. Connolly, Jr., San Jose, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jun. 1, 1978, Ser. No. 911,463
Int. Cl.² G05F 3/00
U.S. Cl. 323—74 **13 Claims**

1. In a circuit chip, a ratio-matched resistance network, consisting of

a plurality of resistances having a rational ratio of resistance

values to each other, wherein all of the resistances each consists of an integral number of simultaneously fabricated equal value resistors of approximately uniform dimensions;

wherein the improvement comprises

at least one of the resistances consisting of a series-parallel combination of the resistors for statistically enhancing the accuracy of the rational ratio of said one resistance to another resistance in the network.

4,224,565

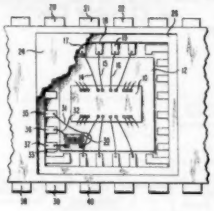
MOISTURE LEVEL DETERMINATION IN SEALED PACKAGES

Jacob Sosniak, Millburn, and Burton A. Unger, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 5, 1978, Ser. No. 912,472

Int. Cl.[2] G01R *27/02, 27/26;* **H01C** *13/00*

U.S. Cl. 324—65 R **9 Claims**



1. An electrical assembly comprising

a housing (**52**, FIG. **4**),

an interior sealed compartment (**54**, FIG. **4**) defined by said housing,

plural conductive elements (**17** through **22** . . . **35** through **40**, FIG. **1**) mounted in said housing, each of said elements having an interior end extending into said compartment and an exterior end extending outside of said housing,

and a moisture sensing unit (**30**, FIG. **1** or **58**, FIG. **4**) mounted in said compartment,

said assembly being CHARACTERIZED IN THAT said housing includes an exterior recess (**50**, FIG. **3** or **60**, FIG. **4**) in close proximity to and in aligned registry with said unit, said recess being adapted to receive therein a cooling head (**62**, FIG. **4**).

4,224,566

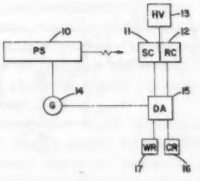
PULSED ELECTRON ATTACHMENT CONDUCTIVITY DETECTOR AND CARCINOGEN MONITOR FOR LIQUID CHROMATOGRAPHY

George Bakale, 2169 Rexwood Rd., Cleveland Heights, Ohio 44118, and Earle C. Gregg, 328 N. Main St., Chagrin Falls, Ohio 44022

Filed Mar. 3, 1977, Ser. No. 773,831

Int. Cl.[3] G01N *27/00*

U.S. Cl. 324—71 R **10 Claims**



1. A method of determining the electron attachment rate of an unknown electrophilic compound by a pulsed conductivity technique which comprises:

(a) dissolving the unknown compound in a nonpolar solvent;

(b) passing the solvent containing the unknown compound in a sample compartment of a dual compartment ionization chamber with the other compartment containing a reference standard consisting of the same nonpolar solvent without the unknown compound, and each compartment having a set of collecting electrodes;

(c) irradiating the dual compartment ionization chamber with ionizing radiation to produce quasifree electrons in the nonpolar solvents in each compartment;

(d) connecting both sets of ionization chamber electrodes to an electronic measuring device; and

(e) measuring and recording as a function of time the difference between the current from the compartments containing the reference standard and the unknown compound to determine the electron attachment rate of the latter.

4,224,567

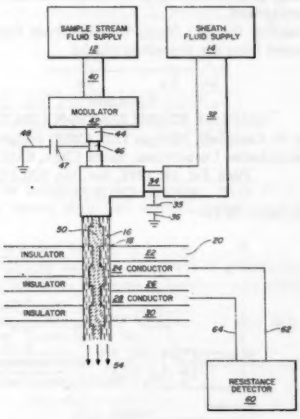
APPARATUS FOR MEASURING RESISTANCE CHANGE ONLY IN A CELL ANALYZER AND METHOD FOR CALIBRATING IT

Robert A. Hoffman, Los Alamos, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,632

Int. Cl.[2] G01N *27/00*

U.S. Cl. 324—71 CP **9 Claims**



1. A method of calibrating a cell size measuring apparatus utilizing an electrode surrounded orifice comprising:

passing a sheath fluid having a first salinity through the orifice;

passing a sample stream fluid having a second salinity within the sheath fluid through the orifice;

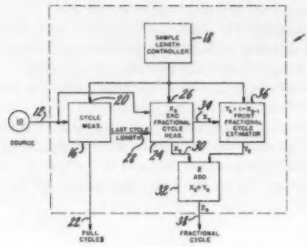
modulating the diameter of the sample stream in a predetermined pattern; and

measuring resistive changes across the orifice occuring in accordance with the modulated diameter sample stream.

4,224,568
FREQUENCY TO DIGITAL CONVERTER

Paul Griner, Maryland Heights, Mo., assignor to Wagner Electric Corporation, St. Louis, Mo.

Filed May 8, 1978, Ser. No. 903,860
Int. Cl.[2] G01R 23/10; B60T 8/02
U.S. Cl. 324—78 D **18 Claims**



1. A method for measuring the frequency of an alternating signal during a fixed sample period comprising the steps of:

(a) measuring the number of full cycles of said alternating signal in said fixed sample period;

(b) calculating the end fraction less than one of a full cycle between the end of the last full cycle in a sample period and the end of said sample period comprising the steps of:

(i) generating clock pulses;

(ii) measuring the number of clock pulses during the last full cycle within a sample period;

(iii) measuring the number of clock pulses occurring between the end of the last full cycle in the sample period and the end of the sample period; and

(iv) dividing the number of clock pulses of (iii) by those of (ii) to obtain an end fraction of a cycle;

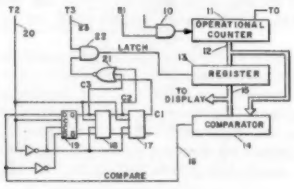
(c) subtracting said end fraction from one and storing the result as an estimate of the front fraction in the next sample period; and

(d) adding the end fraction to the front fraction estimate stored from the preceding period.

4,224,569
DISPLAY STABILIZATION CIRCUIT

Eugene H. Campbell, Morgan Hill, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 19, 1978, Ser. No. 920,222
Int. Cl.[2] G01R 23/02
U.S. Cl. 324—78 D **9 Claims**



1. An electronic instrument having a stabilized display, said instrument comprising:

counter means for counting clocking signals during spaced apart time intervals to generate a count in each of said intervals representative of a measurement made by said instrument;

register means coupled to said counter means for storing selected ones of said counts in response to a LATCH signal;

display means coupled to said register means for visually displaying characters representative of the count held in said register means;

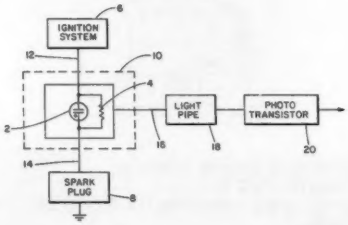
comparator means coupled to said counter means and to said register means for generating an output signal between each of said time intervals indicating whether or not the contents of said counter means and said register means are equal; and

control means for generating said LATCH signal in response to a predetermined sequence of non-equality indications from said comparator means, and for generating said LATCH signal for each successive non-equality indication from said comparator means after said predetermined sequence.

4,224,570
ENGINE SPEED INDICATOR

Francis P. Meserow, Highland Park, Ill., assignor to Simpson Electric Company, a Division of American Gage & Machine Company, Elgin, Ill.

Filed Dec. 11, 1978, Ser. No. 968,618
Int. Cl.[2] G01P 3/36
U.S. Cl. 324—175 **8 Claims**

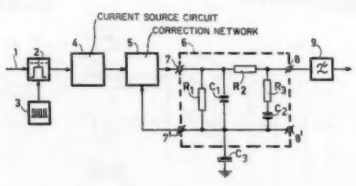


1. Internal combustion engine speed sensing apparatus comprising: a current responsive light producing device; means for connecting said device to the firing circuit for a spark plug in an internal combustion engine whereby said device will produce light each time the spark plug is fired; means for producing an electrical signal in response to light generated by said device; and means for providing a visible indication of the light so produced.

4,224,571
DELTA MODULATION DECODER WITH CHARGE QUANTA MAGNITUDE CORRECTION

Eise C. Dijkmans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 30, 1978, Ser. No. 956,550
Claims priority, application Netherlands, Nov. 18, 1977, 7712706
Int. Cl.[2] H03K 13/02
U.S. Cl. 375—28 **1 Claim**



1. A delta modulation decoder for converting a digital signal into an analog signal, this digital signal being constituted by a

sequence of pulses of a first and a second kind, said decoder comprising:

means having applied thereto said digital signal and having a control input and an output, said means producing at its output in response to each of the pulses of the first kind, a positive charge quantum and producing in response to each of the pulses of the second kind, a negative charge quantum;

a decoder integrating network having a first input and a first output terminal, a common second input and second output terminal and including a first integrating capacitor connected between said input terminals;

a second integrating capacitor for connecting said common second input and second output terminals of the integrating network to ground; and

means for connecting the common second input and output terminals of said decoder integrating network to the control input of said charge quantum producing means for applying thereto the voltage across the second integrating capacitor to control the magnitude of at least one of the two kinds of charge quanta produced.

4,224,572

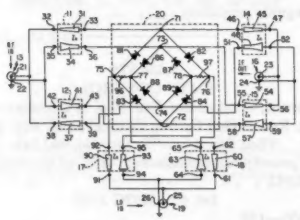
BROADBAND DOUBLY BALANCED MIXER HAVING IMPROVED TERMINATION INSENSITIVITY CHARACTERISTICS

Peter Will, Denver, Colo., assignor to Adams-Russell Co., Inc., Waltham, Mass.

Filed May 16, 1979, Ser. No. 39,693

Int. Cl.[2] H04B *1/26;* **H03H** *7/42*

U.S. Cl. 455—326 **11 Claims**



1. In a broadband mixer having first, second, and third balun means connected between first, second and third signal ports and frequency converter means including first and second sets of nonlinear devices arranged to convert first and second high frequency electrical signals applied to said first and second signal ports to a third high frequency electrical signal at said third signal port, the improvement comprising:

said first balun means being connected to said second balun means and said frequency converter means to form a first 0–180 degree hybrid junction preventing transmission of high frequency electrical signals between said first and second signal ports; and

first and second dissipative means for absorbing undesired signal harmonic energy applied to said third balun means and said frequency converter means to form a second 0–180 degree hybrid junction preventing transmission of high frequency electrical signals between said third signal port and said first and second signal ports.

4,224,573

ELECTRIC CIRCUIT DEVICE AND PENDULUM UNIT INCORPORATING SUCH DEVICES

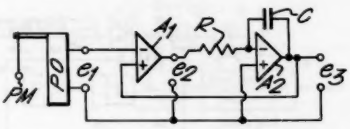
David L. Brook, Watford, England, assignor to S. G. Brown Limited, Watford, England; by said David L., Brook; part interest

Filed Aug. 2, 1978, Ser. No. 930,203

Claims priority, application United Kingdom, Aug. 5, 1977, 32981/77

Int. Cl.[3] G01C *9/06, 9/12*

U.S. Cl. 328—1 **6 Claims**



1. In combination, pendulum means, pick-off means associated with said pendulum means and adapted to provide an electrical output signal dependent on displacement of said pendulum means in response to influences external to said unit, and electric circuit means connected to said pick-off means to receive said pick-off means output signal, said circuit means being adapted to provide an output signal representing only such changes in said pick-off means output signal as are below a predetermined rate.

4,224,574

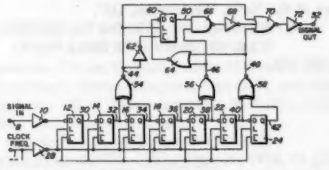
DIGITAL FREQUENCY QUADRUPLER

Mark L. Shaw, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1978, Ser. No. 946,474

Int. Cl.[2] H04B *1/00;* **H03K** *5/00;* **H04B** *7/00*

U.S. Cl. 328—38 **4 Claims**



1. A method for improving the operating range of a frequency multiplier having input and output signals, comprising steps of:

detecting the incoming signals;

delaying the incoming signal in a plurality of series coupled clock controlled delay elements to produce a plurality of delayed signals;

sensing coincidence between at least two of said delayed signals; and

inserting extra pulses in the output of the multiplier responsive to the coincidence sensing step.

4,224,575

PHASE/FREQUENCY CONTROLLED PHASE SHIFT KEYED SIGNAL CARRIER RECONSTRUCTION CIRCUIT

William H. Mosley; Lex A. Scott, both of St. Petersburg, and Robert S. Gordy, Largo, all of Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Nov. 29, 1978, Ser. No. 964,466

Int. Cl.[3] H03D *3/18;* **H03L** *7/08*

U.S. Cl. 329—50 **19 Claims**

1. A phase shift keyed carrier recovery loop, comprising in combination:

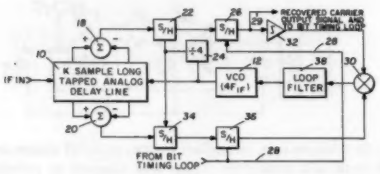
means for taking samples of an input signal at timing intervals so as to generate quadrature displaced first and second channels,

means for combining the samples of one channel into a first filtered signal,

means for combining the samples of the second channel into a second filtered signal,

means for sampling and storing the first filtered signal at selected intervals,

means for sampling and storing the second filtered signal at selected intervals,



means for combining a stored sample of the first filtered signal with a stored sample of the second filtered signal to generate a control signal,

means responsive to the control signal to establish the timing intervals of said means for taking samples and for establishing the selected intervals for sampling and storing the first and second filtered signals; and

means for outputting a stored sample of one of the first and second filtered signals as the recovered carrier signal.

4,224,576

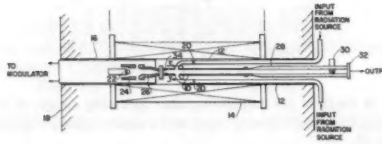
GYROTRON TRAVELLING-WAVE AMPLIFIER

Victor L. Granatstein; Phillip Sprangle, both of Silver Spring, Md.; Adam T. Drobot, Annandale, Va.; Kwo R. Chu, Annandale, Va., and J. Laurence Safter, Alexandria, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 19, 1978, Ser. No. 943,894

Int. Cl.³ H01S *1/00*; H01J *23/16*

U.S. Cl. 330—4 **12 Claims**



1. A gyrotron travelling-wave amplifier comprising in combination:

wave-launching means for launching a travelling wave in a preferred mode at a selected frequency ω;

beam-producing means for forming and propagating an annular beam of electrons at relativistic speeds along a path;

a fast-wave structure, coupled to said wave-launching means and said beam-producing means, wherein said wave and said beam propagate and interact for transferring energy from said beam to said wave, thereby amplifying said wave; and

means for forming a magnetic field B about said beam-producing means and fast-wave structure, said magnetic field having a uniform axial component B_{zo} in the region of the fast-wave structure and said magnetic field having both an axial component B_{zg} and a radial component B_{rg} about said beam-producing means, said axial B_{zg} and radial B_{rg} components being chosen so as to form a beam of electrons with a velocity component $v_\perp$, transverse to the axial direction, for causing said electrons to form cyclotron orbits about the axial lines of said magnetic field B_{zo}, said magnetic field B_{zo} being chosen for causing said electrons to gyrate in said orbits at a cyclotron frequency ω_{ce} given by $\omega_{ce}=qB_{zo}/m$, where q and m are the charge and relativistic mass, respectively, of an electron, and where B_{zo} is of a magnitude such that said selected frequency ω of said travelling wave is slightly higher than $qB_{zo}/m+k_z v_z$, where k_z is the axial wave number of the travelling wave and v_z is the axial velocity of the electrons.

4,224,577

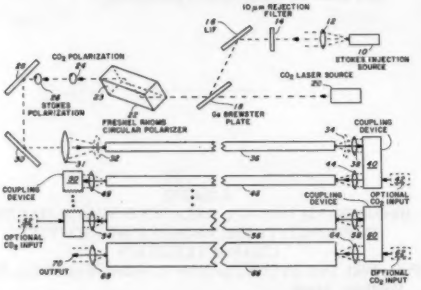
MULTISTAGED STOKES INJECTED RAMAN CAPILLARY WAVEGUIDE AMPLIFIER

Norman A. Kurnit, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 3, 1978, Ser. No. 957,630

Int. Cl.² H03F *7/00*

U.S. Cl. 330—4.5 **53 Claims**



1. A Stokes injected Raman waveguide amplifier using rotational states in a diatomic molecular gas comprising:

a plurality of capillary waveguide amplifiers;

means for optically coupling said plurality of capillary waveguide amplifiers.

4,224,578

GAIN CONTROL

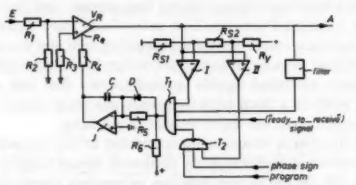
Jürgen Bernitt, Wankendorf, Fed. Rep. of Germany, assignor to Dr.-Ing. Rudolf Hell GmbH, Postfach, Fed. Rep. of Germany

Filed Sep. 13, 1978, Ser. No. 942,041

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1977, 2741952

Int. Cl.³ H03G *3/20*

U.S. Cl. 330—138 **10 Claims**



1. A regulation device for controlling the level of a signal fluctuating in amplitude,

comprising in combination:

signal control means having a controllable amplification, at least one input and one output, and inhibiting and enabling means for selectively inhibiting and enabling said controllable amplification,

a first threshold stage having a first predetermined signal threshold, and having a first input, and a first output,

a second threshold stage having a second predetermined signal threshold exceeding the first predetermined signal threshold, a second input, and a second output, the difference between said thresholds defining a predetermined signal range, said threshold stages being coupled to the output of said signal control means,

an inverter postcoupled to said second threshold stage,

means chargeable to a first potential, including a capacitor having two terminals, dischargeable to a second potential, postcoupled to the outputs of said threshold stages, and connected by feedback to said signal control means for controlling the amplification thereof within said predetermined signal range, the difference between said potentials being substantially linearly related to said predetermined signal range, and

an AND gate having a first input coupled to said first threshold stage, a second input coupled to said inverter, and an output coupled to one terminal of said capacitor, the other terminal of said capacitor being coupled to said signal control means,

whereby an increase of said signal substantially within said predetermined range will decrease the amplification of said signal control means, while a decrease of said signal substantially within said predetermined range will increase the amplification of said signal control means.

4,224,579

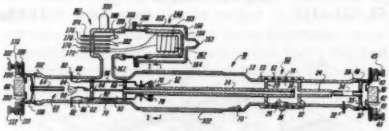
METAL VAPOR LASER DISCHARGE TUBE

Calvin J. Marlett, LaCrescenta; Edwin A. Reed, Upland; Richard C. Johnson, and William F. Hug, both of Pasadena, all of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 13, 1978, Ser. No. 885,839

Int. Cl.³ H01S *3/22*

U.S. Cl. 331—94.5 G **6 Claims**



1. A gas laser comprising an envelope; a gaseous medium disposed within said envelope, said medium comprising a mixture of first and second components; said first gas component initially being at a first pressure value; at least one anode and one cathode disposed within said envelope; means disposed at opposite ends of said gas laser envelope for forming an optical resonant cavity; means for applying a potential between said anode and cathode to provide a discharge in said gaseous medium which results in stimulated emission gain for continuous wave generation of laser radiation; a controllable source of said first gas mixture component; means for controlling the pressure of said second gas mixture component; means for generating a signal when the pressure of said first gas component within said envelope falls below a second pressure value; and means responsive to said generated signal for controlling said controllable source, wherein said first gas component is released within said gas envelope such that the pressure of said first gas component is increased to substantially said first pressure value.

4,224,580

QUARTZ CRYSTAL OSCILLATOR

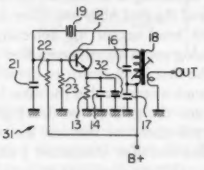
Akiyuki Yoshisato, and Katsumi Tobita, both of Soma, Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 805,860, Jun. 13, 1977, abandoned. This application Nov. 6, 1978, Ser. No. 958,246

Claims priority, application Japan, Jun. 18, 1976, 51-79913

Int. Cl.² H03B *5/06, 5/36*

U.S. Cl. 331—116 R **6 Claims**



1. A crystal oscillator comprising:

a resonant circuit including a crystal;

an active element connected to said resonant circuit for applying a driving excitation to said resonant circuit;

a first capacitor connected to said active element for stabilizing operation of said oscillator, said first capacitor having a relatively low impedance to signals in the frequency range of said oscillator;

feedback means connected between said resonant circuit and said active element for applying a feedback signal from said resonant circuit to said active element; and

initialization means including an electrolytic capacitor connected in parallel with said first capacitor for increasing the gain of said active element above a normal value for a predetermined length of time after initial energization of the oscillator.

4,224,581

COMPANDER SYSTEM HAVING LIMITER IN COMPRESSOR AND EXPANDER

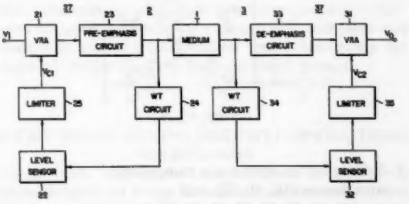
Hiroshi Watanabe, Tokyo; Kenjiro Endoh; Motokazu Ohkawa, both of Yokohama; Kazuo Kitagawa, Kawasaki, and Hideshi Kira, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Oct. 21, 1977, Ser. No. 844,198

Claims priority, application Japan, Oct. 21, 1976, 51-126562; Oct. 21, 1976, 51-126563; Oct. 21, 1976, 51-141601[U]; Oct. 21, 1976, 51-141602[U]

Int. Cl.² H04B *1/64;* H03G *7/00*

U.S. Cl. 333—14 **14 Claims**



1. A noise reduction system having an encoder which compresses the dynamic range of an analog signal for producing a compressed analog audio signal to be transferred and a decoder which expands the compressed analog audio signal obtained from a recording or transmission medium thereby to restore the dynamic range of the analog audio signal, whereby the noise in the analog audio signal caused by the recording or transmission medium is reduced, the encoder including a first controlled amplifier by which the gain and the degree of the

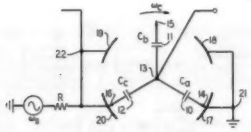
emphasis for high frequency range of the encoder are controlled in accordance with the amplitude of the analog audio signal, the decoder having a second controlled amplifier having a transfer function which is substantially inverse to that of the first controlled amplifier of the encoder, the first controlled amplifier comprising a first voltage controlled amplifier (VCA) receiving the analog audio signal and being rendered to vary the amplification factor thereof by a first controlling voltage, a first high-pass filter receiving the analog audio signl, and means for obtaining a difference between the outputs of the first VCA and the first high-pass filter, the encoder further including a first level sensor for detecting the level of the compressed analog audio signal, and a first limiter for limiting the output of the first level sensor to obtain said first controlling voltage in such a manner that the ratio between the gain of the first VCA and the gain of the first high-pass filter at the pass band thereof does not become less than one, and the second controlled amplifier comprises a second voltage controlled amplifier (VCA) rendered to vary the amplification factor in accordance with a second controlling voltage, a second high-pass filter having an input coupled to an output of the second controlled amplifier, and means for adding the output of the second high-pass filter to the compressed analog audio signal to send forth the added signal to the second VCA to constitute a positive feedback loop, the decoder further comprising a second level sensor for detecting the level of the compressed analog audio signal, and a second limiter for limiting the output of the second level sensor to obtain said second controling voltage in such a manner that the loop gain of the positive feedback loop at the pass band of the second high pass filter does not become more than one.

4,224,582

COMMUTATING CAPACITIVE ENVELOPE DETECTOR

William Kaminski, West Portal, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Oct. 19, 1978, Ser. No. 952,837
Int. Cl.[2] H03H *7/10, 7/14*
U.S. Cl. 333—173 **11 Claims**



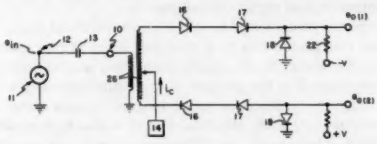
1. A filter for an input wave comprising:
n capacitances (**10, 11, 12**), and
means (**14, 15, 16, 17, 18, 19, 20, 22**) for applying each of the capacitances across the input wave at one of n equally spaced points of each wave cycle and for obtaining from each capacitance concurrently with the application the resultant capacitance charge, characterized by
means (**13**) for obtaining a portion of the capacitance charge during the spacing between the corresponding point and an adjacent point, and
means (**204, 205, 206**) for combining the capacitance charge and the portion thereof.

4,224,583

LINEAR RF ATTENUATOR

Stephen J. Larkin, Palm Bay, Fla., assignor to Raytheon Company, Lexington, Mass.

Filed Nov. 29, 1978, Ser. No. 964,559
Int. Cl.[2] H03H *7/24*
U.S. Cl. 333—100 **5 Claims**



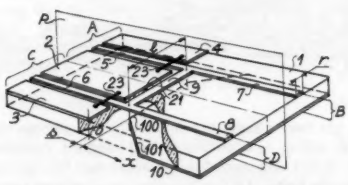
1. In combination:
a terminal adapted for connecting to a source of rf signal;
an rf transformer having the primary side connected to said terminal;
said rf transformer having a center tap on its secondary side adapted for coupling to a source of dc control current;
a first PIN diode having its anode connected to a first secondary side of said transformer;
a second PIN diode having its anode connected to dc ground and its cathode connected to the cathode of said first PIN diode;
a source of negative voltage connected through a first resistor to said cathode of said first PIN diode;
a third PIN diode having its cathode connected to a second secondary side of said transformer;
a fourth PIN diode having its cathode connected to dc ground and its anode connected to the anode of said third PIN diode; and
a source of positive voltage connected through a second resistor to said anode of said third PIN diode.

4,224,584

DIRECTIONAL MICROWAVE COUPLER

Michel Houdart, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 9, 1979, Ser. No. 18,893
Claims priority, application France, Mar. 14, 1978, 78 07281
Int. Cl.[2] H01P *5/18*
U.S. Cl. 333—116 **11 Claims**



1. A directional microwave coupler comprising at least two coupled transmission lines on one and the same substrate of dielectric material, comprising on the one hand, on a first face of the substrate of dielectric material:
an arrangement of conductive zones and strips respectively forming two coplanar lines having a common central conductive zone, the central conductive strips of each of the coplanar lines respectively continuing into other conductive strips and a transverse conductive strip forming an electrical connection between the central conductive strips of the coplanar lines and the conductive strips into which the central conductive strips of the coplanar lines continue, and on the other hand, on a second face of the substrate of dielectric material opposite from the first face,

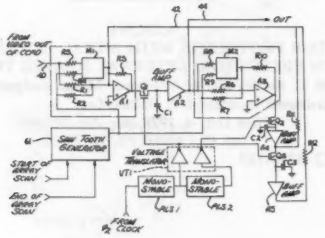
a conductive underlay which is coupled electrically to the central conductive zone common to the coplanar lines, the conductive underlay forming microstrip lines in conjunction with the conductive strips into which the central conductors of the coplanar lines continue, the coplanar lines and the microwave strips formed by the conductive strips into which the central conductive strips of the coplanar lines continue each forming one channel of the coupler.

4,224,585

METHODS AND APPARATUS FOR COMPENSATING FOR CHARGE TRANSFER INEFFICIENCY IN IMAGING AND OTHER VARIABLE LENGTH CHARGE TRANSFER DEVICES

Satoru C. Tanaka, Milpitas, Calif., assignor to Reticon Corporation, Sunnyvale, Calif.

Filed Aug. 28, 1978, Ser. No. 937,447
Int. Cl.[3] H03H *17/04;* H03K *5/14;* G11C *27/02, 19/28*
U.S. Cl. 333—165 **26 Claims**



1. A method of compensating for charge transfer inefficiency in charge transfer devices having varying numbers of discrete charge transfers to sequentially shift each signal from its original storage cell to the device output comprising the steps of:

(a) for each device output signal, preserving a signal responsive to that output signal for at least one subsequent transfer; and

(b) compensating the subsequent output signal after the subsequent transfer by combining the preserved signal with the subsequent device output signal in a varying amount, the varying amount being dependent upon the approximate number of transfers that were required for the preserved signal to shift from its origin in the device to the output thereof.

4,224,586

MONOLITHIC CRYSTAL FILTER HAVING A PASSBAND SYMMETRICAL ABOUT A CENTER FREQUENCY

Robert O. Loving, Jr., Streamwood, and Ralph A. Kamin, Jr., Elk Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

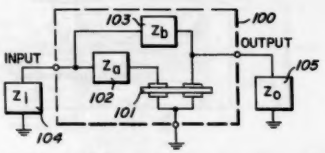
Filed Oct. 10, 1978, Ser. No. 950,201
Int. Cl.[3] H03H *9/56, 9/58, 9/205*
U.S. Cl. 333—192 **16 Claims**

1. A filter having a predetermined passband symmetrically located about a center frequency, said filter comprising:

monolithic crystal filter means having first and second pairs of electrodes, the first and second pairs of electrodes having substantially identical predetermined resonating frequencies;

series impedance means having a first terminal and having a second terminal coupled to one of the first and second pairs of electrodes for adapting the resonating frequency of said one pair of electrodes so that the geometric mean of the adapted and non-adapted electrode pair resonating frequencies is substantially the same as the passband center frequency; and

bridging impedance means having a first terminal coupled to the non-adapted electrode pair of the monolithic crystal filter means and having a second terminal coupled to the



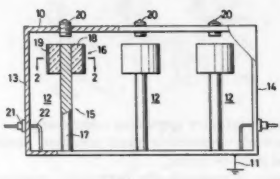
first terminal of the series impedance means for providing predetermined first and second stopbands that are symmetrically located above and below the filter passband, respectively, for attenuating frequencies outside of the filter passband.

4,224,587

COMB-LINE BANDPASS FILTER

Mitsuo Makimoto, and Sadahiko Yamashita, both of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Nov. 7, 1978, Ser. No. 958,499
Claims priority, application Japan, Nov. 8, 1977, 52-134207
Int. Cl.[2] H03H *7/10*
U.S. Cl. 333—205 **7 Claims**



1. A comb-line bandpass filter comprising:

an outer conductor;

a plurality of inner conductors successively arranged parallel within said outer conductor, one end of each of said inner conductors being capacitively coupled to said outer conductor;

a body of dielectric material encircling a portion of each of said inner conductors adjacent to said one end thereof;

a layer of conductive material encircling said dielectric body and conductively coupled to said outer conductor; and

means for injecting microwave energy into said outer conductor at one end wall thereof and withdrawing said injected energy from the outer end wall thereof.

4,224,588

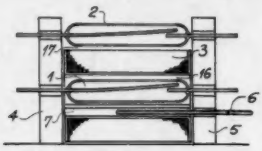
ELECTRIC RELAY HAVING MULTIPLE OPERATIONAL THRESHOLDS

Gerard Holvoet, and Michel Nicolas, both of Courbevoie, France, assignors to Orega Circuits et Communication, Paris, France

Filed Jun. 22, 1978, Ser. No. 918,265
Claims priority, application France, Jun. 27, 1977, 77 19618
Int. Cl.[2] H01H *1/66, 37/32*
U.S. Cl. 335—152 **7 Claims**

1. An electric relay having multiple operational thresholds comprising a solenoid in the form of a coil with an inner passage, and two groups of switches each group including at least one switch of the flexible blade type having sealed contacts, said coil connected to a source of electric energy creating

magnetic flux within the coil and outside the coil, wherein said two groups of switches are respectively distributed in the magnetic flux existing inside said coil and the magnetic flux



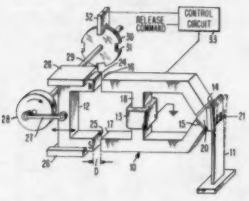
existing outside said coil such that the at least one switch in the group of switches inside said coil responds to a different level of current in said coil than the at least one switch in the group of switches distributed outside said coil.

4,224,589

LOW ENERGY MAGNETIC ACTUATOR

John C. Tamulis, Binghamton, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1978, Ser. No. 974,298
Int. Cl.[2] H01F *7/10*
U.S. Cl. 335—237 **6 Claims**



1. Magnetic actuator apparatus comprising:
a magneticaly permeable core member having first and second pairs of poles;
an actuator of magnetically permeable material attractable across said first pair of poles and resiliently biased toward a released position;
a permanent magnet movable with respect to said second pair of poles for producing magnetic flux in a said core member varying in density between a first value and a second value lower than the first value, each being sufficient to hold said actuator attracted to said first pair of pole faces; and
means selectively operable at the time said flux density is at said second value for reducing said density still further to release said actuator.

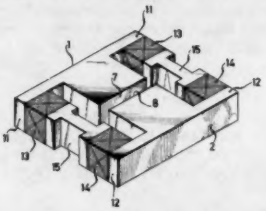
4,224,590

MAGNETIC-TECHNICAL SYSTEM WITH A MAGNETIC CIRCUIT COMPRISING AT LEAST TWO MAGNETS

Heinrich Spodig, Netteberge 202, 4714 Selm-Bork, Fed. Rep. of Germany

Continuation of Ser. No. 766,352, Feb. 7, 1977, abandoned. This application Jan. 6, 1978, Ser. No. 867,217
Claims priority, application Fed. Rep. of Germany, Feb. 23, 1976, 2607197
Int. Cl.[3] H01F *7/02*
U.S. Cl. 335—306 **1 Claim**

1. Permanent magnetic-technical system comprising two symmetrically arranged T-shaped mild iron or steel parts resting against opposite poles of separate spaced sets of permanent magnets and forming intermediate frontal surfaces projecting into the space between said sets of permanent magnets, which oppose each other in the direction of magnetizing of the magnets and forming by means of said frontal surfaces an operating air gap with opposite polarities, and wherein, between the mild iron or steel parts, four parallelly magnetized permanent magnets are arranged which are connected in series in pairs in the



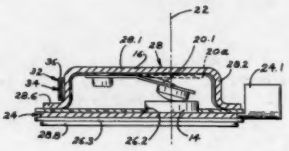
direction of magnetizing by means of each of two separate I-shaped mild iron or steel parts symmetrically arranged to the operating air gap, said magnetized permanent magnets being positioned out of alignment with the said air gap.

4,224,591

MOTOR PROTECTOR WITH METAL HOUSING AND WITH PREFORMED EXTERNAL HEATER THEREON

Ronald E. Senor, North Attleboro, Mass., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 4, 1978, Ser. No. 965,801
Int. Cl.[2] H01H *61/02, 71/02*
U.S. Cl. 337—102 **4 Claims**



1. A thermally responsive motor protector comprising a rectilinear metal housing having a body component and a cover component secured together in electrically insulated relation to each other to form an enclosure, thermally responsive means mounted within the enclosure normally closing a circuit between the body and cover and movable when heated to a selected temperature for opening that circuit, and a heater having a flat ribbon of metal of selected electrical resistance properties having a deformable electrically insulating coating covering a central portion of the ribbon, said coating being deformed at selected locations and being folded at said locations for disposing selected portions of the metal ribbon in heat transfer relation to selected rectilinear portions of said housing, said ribbon having one end thereof electrically connected to one of said housing components and having its opposite end disposed to be connected in an electrical circuit.

4,224,592

MINIATURE PLUG-IN FUSE ASSEMBLY AND METHOD OF MANUFACTURE

Angelo Urani, and Aldino J. Gaia, both of St. Louis, Mo., assignors to McGraw-Edison Company, Elgin, Ill.

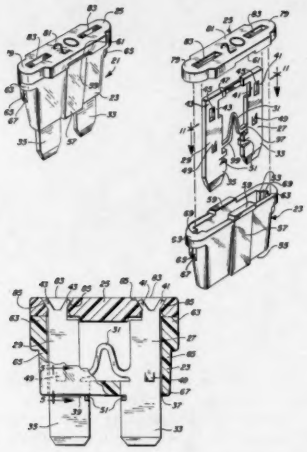
Filed Apr. 3, 1978, Ser. No. 892,743
Int. Cl.[2] H01H *85/02*
U.S. Cl. 337—198 **21 Claims**

1. A miniature plug-in fuse assembly comprising:
a pair of electrically conductive legs;
a fuse link extending between said conductive legs;
an insulating casing having a pair of openings preformed

therein, including a hollow body and a cover, a pair of openings preformed in the hollow body, said cover closing the end of the body opposite said openings to wholly enclose a portion of said conductive legs and said fuse link;

a projecting plug-in member formed at one end of each of said conductive legs;

said plug-in members of said conductive legs extending from said casing through said pair of openings; and



fastening means for securing said conductive legs and said fuse link in a fixed location with respect to said hollow body, said fastening means further including retaining means on said legs for securing said cover to said hollow body;

whereby an easily produced and mechanically secure fuse assembly is provided with said fuse link totally enclosed to preclude the adverse effects of having the interior of said casing open to the atmosphere.

4,224,593

DOUBLE-MOTION THERMOSTAT

Jerome K. Hastings, Sussex, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 21, 1978, Ser. No. 971,807
Int. Cl.[2] H01H *37/60*
U.S. Cl. 337—334 **11 Claims**

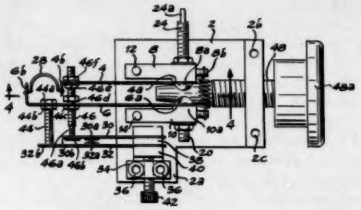
1. A double-motion thermostat comprising:

a pair of bimetal members;

means mounting said bimetal members at first portions thereof such that other, active portions thereof move in opposite directions in response to temperature change;

overcenter snap-action means coupled between said active portions of said bimetal members for tripping at a predetermined temperature level to drive said active portions still farther in said opposite directions;

a pair of electrical contacts; and



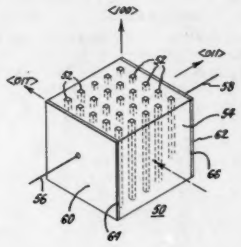
driving means coupling said active portions of said bimetal members to the respective contacts of said pair of electrical contacts.

4,224,594

DEEP DIODE MAGNETORESISTOR

Thomas R. Anthony, Schenectady, N.Y., and Harvey E. Cline, Stanford, Calif., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,387
Int. Cl.[2] H01L *43/00*
U.S. Cl. 338—32 R **15 Claims**



1.

A magnetoresistor comprising:

a body of high carrier mobility semiconductor material having two opposed major surfaces forming respectively the top and bottom surfaces of the body, two opposed end surfaces, a first predetermined level of resistivity, a predetermined first type conductivity, a preferred crystal structure and a vertical axis substantially perpendicular to the major opposed surfaces aligned $\geqq 0°$ to $\leqq 10°$ with a first crystal axis of the semiconductor material of the body;

at least one of the opposed major surfaces having a predetermined crystal planar orientation which is one selected from the group consisting of (100), (110), and (111);

a plurality of spaced, substantially parallel regions formed in the body, each spaced region extending between, and terminating in, the opposed major surfaces of the body and oriented substantially perpendicular thereto and having a longitudinal axis and a vertical axis aligned parallel with the vertical axis of the body and from $\leqq 0°$ to $\geqq 10°$ with the first crystal axis of the body, a first type conductivity and a second predetermined level of resistivity, which is lower in magnitude than that of the first predetermined level of resistivity;

each spaced region consisting of recrystallized semiconductor material of the body formed in situ by the migration of a melt of a metal-rich semiconductor material of the body through the material of the body by thermal gradient zone melting at a predetermined elevated temperature along a

thermal gradient aligned substantially parallel with the vertical axis of the body and having a predetermined level of concentration of the metal of the melt therein as determined by the solid solubility limit of that metal in that semiconductor material at that predetermined elevated temperature of migration;

the metal is distributed substantially uniformly throughout the recrystallized material of each spaced region and the metal includes at least one dopant impurity material to impart the first predetermined type conductivity and the second predetermined level of resistivity to the recrystallized semiconductor material;

an ohmic electrical contact affixed to each of the two end surfaces of the body;

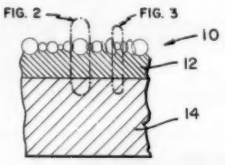
whereby when the body is placed in a magnetic field and an electrical current is impressed through the body between the two ohmic electrical contacts, the magnetoresistor functions as a variable electrical resistor, the magnitude of which is dependent upon the magnitude of the magnetic field acting on the body perpendicular to both the path of the electrical current and the longitudinal axis of each region.

4,224,595

GRADED PARTICLE ADSORPTION TYPE SENSOR AND METHOD OF IMPROVING PERFORMANCE OF AN ADSORBING SENSOR

James P. Dolan, Seattle, Wash., assignor to ADS Systems, Inc., Seattle, Wash.

Filed Nov. 2, 1978, Ser. No. 957,174
Int. Cl.[2] H01L *7/00*
U.S. Cl. 338—34 **6 Claims**



1. An adsorbing sensor of the type having electrically conductive adsorbent particles resiliently embedded in a surface and forming an electrical conductive path through the sensor the resistance of which varies in response to the presence of an adsorbate medium exposed to the particles, the improvement comprising:

first adsorbent particles of a first size attached to said surface, extending outwardly from the surface in a position to be exposed to the adsorbate medium, and having a resilient anchoring force against movement of a first low magnitude,

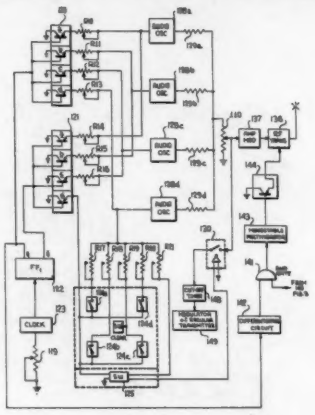
a plurality of adsorbent particles of additional sizes interspersed with said first particles, attached to said surface, extending outwardly from the surface in a position to be exposed to the adsorbate medium, and having a resilient anchoring force against movement of magnitudes different than said first lower magnitude, said first and additional sized particles engaging one another externally of said surface to form said electrical conducting path, and whereby absorption forces which cause the adsorbate to force the particles apart and thus change the resistance of the conductive path, changes the resistance more smoothly and over a greater range than with one uniform size of particles.

4,224,596

OBJECT LOCATOR SYSTEM EMPLOYING VARIABLE FREQUENCY CODE TONE GENERATORS

Elwyn R. Knickel, 2647 Woodley Rd. NW., Washington, D.C. 20008

Filed Mar. 21, 1975, Ser. No. 560,811
Int. Cl.[2] G08G *1/12;* **H04M** *11/00;* **G01P** *3/48*
U.S. Cl. 340—24 **22 Claims**



20. In a system for monitoring the location of movable objects relative to multiple prescribed locations:

an emitter carried by each movable object for automatically transmitting coded signals uniquely identifying that movable object, transmission from said emitters being at some nominal power level;

a plurality of satellite sensor stations, at least one at each of said prescribed locations, each satellite sensor station being arranged to receive signals from an emitter located within a predetermined distance from that satellite sensor station, said prescribed locations being spaced sufficiently to prevent the signal transmitted by an emitter at said nominal power level from being received at more than one satellite sensor station at a time;

a plurality of main sensor stations, each associated with a respective group of said satellite sensor stations;

radio transmitter means in each satellite sensor station for transmitting coded signals received by said satellite sensor station to the main sensor station associated therewith;

radio receiver means at each main sensor station for receiving coded signals transmitted from satellite sensor stations associated with that main sensor station;

a central processing station; and

means at each main sensor station for automatically transferring coded signals received from said satellite sensor stations to said central processing station.

4,224,597

SYSTEM FOR DETECTING UNDERINFLATED TIRE IN A ROLLING VEHICLE

Salvatore A. DiCecio, Irving, Tex., assignor to Avmar, Incorporated, Ronkonkoma, N.Y.

Filed Oct. 27, 1978, Ser. No. 955,361
Int. Cl.[2] B06C *23/00;* **G08G** *1/12*
U.S. Cl. 340—58 **21 Claims**

1. An advisory system for detecting and indicating immediately a selected difference in rotational speed of a pair of load bearing wheels of a vehicle comprising

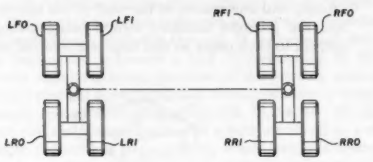
first and second signal generating means associated respectively with first and second vehicle wheels, each including wheel speed transducer means coupled to a wheel, for

producing a continuous DC voltage wheel speed signal which is proportional in linear relation to the rotational speed of the wheel;

electric comparator means for producing an output signal responsive immediately to a selected difference between two DC voltage input signals applied thereto;

electrically operated fault signaling means responsive to an output signal from said comparator means;

means applying as input signals to said comparator means a



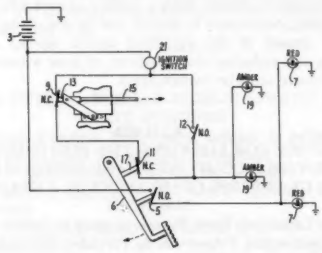
first DC voltage wheel speed signal generated by said first signal generating means, and a second DC voltage wheel speed signal generated by said second signal generating means; said comparator means producing an output signal to activate said fault signaling means, when one of said wheel speed signals changes by a selected DC voltage increment relative to the other of said wheel speed signals, said one wheel speed signal functioning as a triggering signal and said other wheel speed signal functioning as a reference signal.

4,224,598

VEHICLE REACTION SIGNAL

Joseph F. Ostrowski, 2470 Begonia Pl., Santa Cruz, Calif. 95062

Filed Mar. 9, 1979, Ser. No. 19,107
Int. Cl.[3] B60Q *1/26*
U.S. Cl. 340—66 **1 Claim**



1. In a reaction signal warning system for a vehicle equipped with a brake pedal and a switch connected thereto whereby said brake pedal turns on a stop light when said pedal is depressed said vehicle also having a backup light with a switch for turning on said backup light, said backup light being of a different color from said stop light, the improvement comprising:

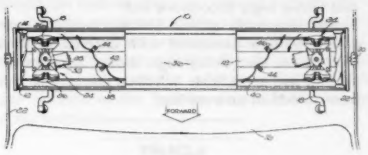
a first switch activated by the accelerator of the vehicle wherein said switch is closed when the throttle of the vehicle is closed and is opened as the throttle on the vehicle is opened and a second switch activated by the brake pedal, said second switch being closed when said brake pedal is not depressed and being open when said brake pedal is depressed, said first and second switches being in series with each other, the combination of said first and second switches being in parallel with said backup light switch of the vehicle whereby said backup light is lighted when the throttle of the vehicle is closed and is off when said brake pedal is activated.

4,224,599

VISUAL WARNING APPARATUS FOR EMERGENCY VEHICLES

Alfred J. Peirish, Jr., Fountain Valley, and Robert E. Knepshield, Costa Mesa, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 7, 1976, Ser. No. 720,752
Int. Cl.[2] B60Q *1/52*; F21M *3/18*
U.S. Cl. 340—84 **11 Claims**



1. A visual warning apparatus for mounting on the roof of an emergency vehicle comprising:

signal light means rotatable about a generally vertical axis;

a reflector positioned approximately to one side of said signal light means and oriented with respect to said signal light means so as to intercept light rays emanating therefrom and deflect the same approximately lengthwise of said vehicle; and

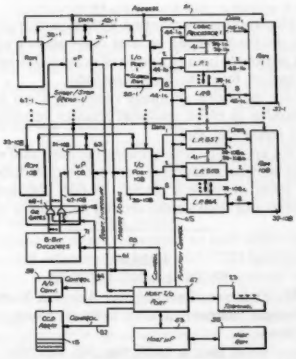
said reflector comprising a plurality of sections convex in a plane of horizontal cross-section, said convex sections facing toward said signal light means.

4,224,600

ARRAYS FOR PARALLEL PATTERN RECOGNITION

Harvey R. Sellner, Newtown, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Mar. 26, 1979, Ser. No. 23,984
Int. Cl.[2] G06K *9/12*
U.S. Cl. 340—146.3 MA **13 Claims**



1. Image analysis apparatus comprising:

a. means to store a plurality of M lines of data, each line made up of spaced pixels with the elements in adjacent odd and even rows offset by one half the distance between pixels so as to generate a hexagonal array, said storing means storing data from adjacent lines in adjacent locations whereby the data in adjacent locations will represent pixels which are offset from each other, the data repre-

sented in each even location being offset by the same amount from the data in each odd location;

b. a plurality of Golay logic processors each capable of receiving as inputs the data representing a central image element and data representing the six image elements forming a hexagonal surround thereabout;

c. means to make available as outputs the data for three adjacent lines stored in said means to store;

d. means to couple to each of said Golay logic processors data representing a central element and the six surrounding elements;

e. means to sequentially shift the data in said storage means into said means providing outputs so that the central element from each line of data is sequentially provided to said Golay logic processors; and

f. means responsive to said shifting means to selectively couple outputs associated with different adjacent data locations to said Golay logic means in response to said shifting and to indicate whether the central element is from an odd or an even line.

4,224,601

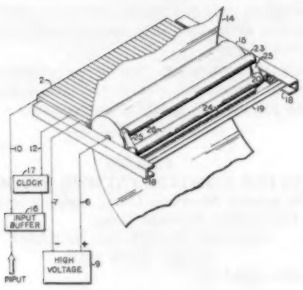
ELECTRODYNAMIC PRINTING SYSTEM

Sam A. Davidson, 111 Glenn Way #9, Belmont, Calif. 94002

Filed Mar. 27, 1978, Ser. No. 890,283

Int. Cl.[2] G03G *17/00;* **G01D** *15/08*

U.S. Cl. 346—150 **63 Claims**



1. An electrodynamic printing system comprising,

a back electrode having at least one conductive stylus,

a front electrode having a store of conductive imaging material spaced from the back electrode,

means for mounting an image receiving sheet between said electrodes in close, material transfer relationship to the front electrode, and

means for applying current pulses between said electrodes to cause current conduction between said electrodes through said sheet to erode a portion of said conductive writing material and transfer the eroded material to said sheet.

4,224,602

SIGNALLING DEVICE

Richard W. Anderson, Reading, and Alfred I. Bottner, Natick, both of Mass., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Dec. 4, 1978, Ser. No. 965,756

Int. Cl.[2] H04B *1/034;* **H01H** *13/04, 9/18;* **G08B** *21/00*

U.S. Cl. 340—321 **13 Claims**

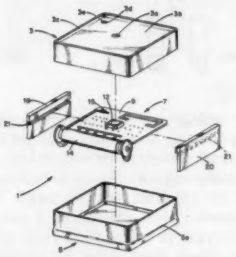
1. A manually-actuated signalling device, comprising:

a first housing;

a signalling circuit assembly disposed within the first housing and including a signalling circuit and a depressible pressure sensitive switch operative when depressed to actuate the signalling circuit; and

a second housing cooperating with the first housing for fully enclosing the signalling circuit assembly within the first and second housing;

said second housing including a resilient semi-rigid deflective wall having an indentation therein extending in the direction of the first housing and physically adjacent to the pressure sensitive switch, said indentation being capable of being manually depressed and, when depressed, to deflect the wall of the housing and physically touch the pressure sensitive switch to transmit the pressure applied to the indentation to the pressure sensitive switch to cause depression of the switch and actuation of the signalling circuit, said indentation in the wall of the second housing and the pressure sensitive switch being arranged with respect to each other so that depression of the switch and



actuation of the signalling circuit can occur only in response to pressure being applied to the indentation in the wall of the second housing, said semi-rigid deflective wall being operative upon release of the pressure applied to the indentation to return to its original position; and

said second housing further including upstanding ridge members integral with the semi-rigid deflective wall and spaced from the indentation in the semi-rigid deflective wall for facilitating the location of the indentation in the deflective wall, for spacing the deflective wall and the indentation therein from a surface against which the signalling device may be placed, and for absorbing the effects of impact of the signalling device against a surface, thereby reducing the possibility of false actuation of the pressure sensitive switch.

4,224,603

DEVICE FOR LOCATING THE POSITION OF A MOVABLE COMPONENT AND ESPECIALLY A VALUE-SETTING COMPONENT IN A FRANKING MACHINE

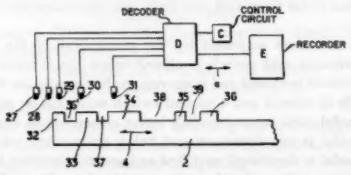
Jacques Lallemand, Paris, France, assignor to Societe d'Etude et de Construction d'Appareils de Precision (S.E.C.A.P.), Boulogne-Billancourt, France

Filed Jun. 6, 1977, Ser. No. 803,660

Claims priority, application France, Jun. 9, 1976, 76 17329

Int. Cl.[2] H03K *13/02*

U.S. Cl. 340—347 P **1 Claim**



1. A franking machine comprising a rotary franking drum having an axially extending shaft, means for driving said drum

through said shaft in such a manner that said drum effects during each cycle of franking operation a full revolution from a rest position of the drum, a plurality of individual printing wheels rotatable relative to said drum and movable therewith about said shaft in a common direction of rotation, a manually operable mechanism for setting the postage value required to be printed by said printing wheels, and a device for producing electric signals representative of the angular printing position taken by each printing wheel in accordance with the selected postal value to be printed, said device comprising:

(a) a plurality of elongated parallel elements **(2)** mounted on said shaft **(113)** for rotation therewith and also for lengthwise sliding motion relative thereto so that said elements are longitudinally shiftable through N incremental positions having an increment a and corresponding to the different angular printing positions of the printing wheels **(8)**, each element being provided with a plurality of longitudinally spaced activating zones **(10, 12, 14, 16, 18)** the length and the mutual spacing of which are equal to a or multiple thereof and each printing wheel being so operatively associated with one of said elements, respectively, that when the printing wheel is rotated through said setting mechanism to any selected angular printing position, the associated element is shifted precisely to that one of said incremental positions thereof which corresponds to the selected angular printing position of the printing wheel; and

(b) a single row of $n<N$ stationary two-state transducers (such as **23, 24, 25, 26**) spaced apart by intervals which are equal to a or multiple thereof, said row extending in parallelism with said shaft and at such radial distance therefrom as to permit said activating zones of the elongated elements to pass during each franking cycle past said row of transducers the number n of which is such that $2^n \geqq N$." wherein each printing wheel is mounted for rotational movement to any one of ten different printing positions, wherein each elongated element is provided with five activating zones, and wherein the single transducer row includes five transducers, the five activating zones being so disposed in respect to the five transducers that in each incremental position of the elongated elements, three of said five zones are capable of activating respectively three of said five transducers in accordance with a decimal digit self-checking code.

4,224,604

DIGITAL OPTICAL DISPLAY WITH MAGNETIC CODE PLATE INDEXING

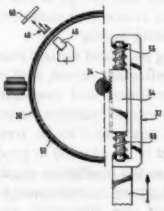
Walter Angst, Zumikon, Switzerland, assignor to Ackeret Design + Engineering, Ebmatingen, Switzerland

Filed Feb. 13, 1978, Ser. No. 877,355

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1977, 2707082

Int. Cl.[2] **G08C** *9/06;* **H03K** *13/00*

U.S. Cl. 340—347 P **28 Claims**



1. Digital optical display device for indicating the position of a moveable measuring member relative to its rest position, the device comprising a code plate adapted to be moved by said measuring member substantially proportionally and provided with a code pattern consisting of opaque and transparent areas, the code plate being irradiated by a stationary light source from one side of the plate while at the other side inlets of light guides are mounted which in accordance with the code pattern illuminate a seven-segment display, an unambiguous display being possible only in certain relative positions of code plate and light guide inlets, the code plate being operatively connected to a magnetic indexing system providing a multiplicity of magnetic indexing locking positions in sequential step by step relation to each other and corresponding to said certain relative positions of the code plate and light guide inlets, while all remaining optical members are stationary, and a spring coupling between the measuring member and code plate for moving the code plate, the coupling being elastically resilient with strength less than the magnetic indexing forces within one magnetic indexing position and the spring coupling having strength in excess of the magnetic indexing forces without one magnetic indexing position and allowing the code plate to be retained precisely at a particular indexing position and within one index position of the location at which the measuring member has stopped.

4,224,605

ANALOG-DIGITAL CODER COMPRISING A CHARGE TRANSFER DEVICE

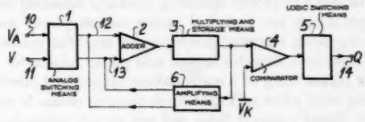
Claude Michaud, and Sylvain Fontanes, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 22, 1978, Ser. No. 963,140

Claims priority, application France, Nov. 11, 1977, 77 35776

Int. Cl.[2] **H03K** *13/02*

U.S. Cl. 340—347 AD **9 Claims**



1. A non-linear analog-digital coder for encoding analog information in accordance with a law consisting of p linear segments, p being a positive integer, each of said segments being quantifed in at most 2^k quanta, each analog datum being encoded in a number of $M=1+n+k$ bits, wherein n is an and represents the number of bits whose value characterizes one of the p segments, with $2^n \leqq p < 2^{n+1}$, k is a positive integer and represents the number of bits whose value characterizes a quantam of the segment determined by n, and 1 corresponds to a sign bit, said coder having an output and comprising:

analog switching means including a voltage divider, and having two inputs for receiving respectively said analog data and a first reference voltage, and two outputs;

an adder, responsive to said analog switching means and having two inputs respectively coupled to the two outputs of said analog switching means;

a CTD having an input respective to said adder and biased by a second reference voltage, said CTD having injection and series reading units made of k+1 groups of at least 2(n+1) cells among which 2n cells are weighted according to the same law as the slopes of said segments;

an analog comparator for comparing the output of said CTD reading units with said second reference voltage;

logic output means responsive to said comparator and having an output coupled to the output of said coder;

a controlled gain amplifier connected between said CTD reading unit and said analog switching means outputs for generating a signal related to the already coded part of the analog datum, the gain of said controlled gain amplifier being related to said already coded part of the analog datum; and

sequencing means for operating said CTD and said con-

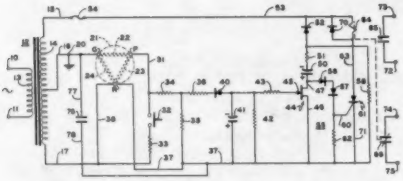
trolled gain amplifier and for generating timing signals to said analog switching means and logic output means.

4,224,606

FLUID LEVEL DETECTOR TEST SWITCH

James I. Bartles, Hudson, Wis., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 21, 1979, Ser. No. 22,581
Int. Cl.[3] G08B *29/00;* **G01R** *27/02;* **G01F** *23/00;* **H01N** *47/12*
U.S. Cl. 340—514 **12 Claims**



1. A control circuit having safety test functions adapted to be connected to fluid level detector means, including: amplifier means having a threshold operating level and including amplifier input means and switched output means; power source means to provide electrical power to said amplifier means and to said fluid level detector means; said power source for said detector means being of a magnitude to exceed said threshold operating level when said fluid level detector means is operational to detect a sensed fluid; and test switch means having impedance means connected to said amplifier input means with said test switch means being operable to place said impedance means across said amplifier input means to reduce a signal to said amplifier input means below said threshold level; said test switch means operation also placing said impedance in series with said fluid level detector means and said power source means; said impedance means being large enough to avoid effectively short circuiting said amplifier input means while being smaller than an impedance sensed by said fluid level detector means.

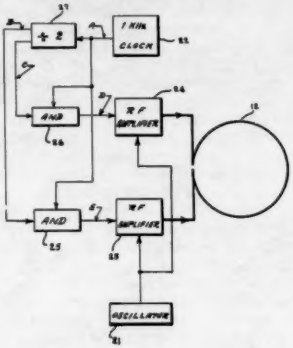
4,224,607

INTRUDER DETECTOR SYSTEM HAVING IMPROVED UNIFORMITY OF DETECTION SENSITIVITY

J. Leon Poirier, Chelmsford; Kotcherlakota V. N. Rao, Bedford, and Livio D. Poles, Dorchester, all of Mass., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 25, 1979, Ser. No. 52,178
Int. Cl.[2] G08B *13/18*
U.S. Cl. 340—552 **4 Claims**

1. An intruder detector system comprising
a length of leaky transmission line encompassing a region to be protected,
antenna means within said region to be protected,
an r.f. receiver and detector means connected to said antenna means, an r.f. transmitter, and



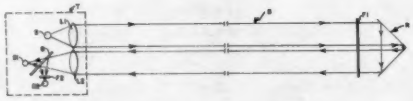
switching means, said switching means periodically connecting said r.f. transmitter to alternate ends of said leaky transmission line.

4,224,608

SINGLE TERMINAL DETECTION SYSTEM

David B. Lederer, Rochester, N.Y., assignor to Detection Systems, Inc., Fairport, N.Y.

Filed Nov. 13, 1978, Ser. No. 960,464
Int. Cl.[2] G08B *13/18*
U.S. Cl. 340—556 **3 Claims**



1. A detection system comprising:
(a) means for transmitting radiant energy through a region under surveillance;
(b) means for polarizing said energy in one dimension;
(c) reflecting means for redirecting radiant energy transmitted by said transmitting means;
(d) means for receiving polarized radiant energy upon being redirected by said reflecting means, said receiving means being positioned proximate said transmitting means and comprising first and second radiation- sensitive transducer means, each being positioned to be irradiated by said polarized energy and being adapted to produce an electric signal proportional to the irradiation received thereby;
(e) filter means for polarizing radiant energy in a dimension perpendicular to said one dimension, said filter means being positioned in the optical path between said transmitting means and said first transducer means; and
(f) circuit means operatively coupled to said first and second transducers for providing an alarm signal in the event both transducers produce electric signals, or in the event neither transducer produces an electric signal.

4,224,609
DRIVING ASSURANCE SYSTEM FOR WHEELED VEHICLES

Takayuki Yanagishima, and Akira Matsumura, both of Yokohama, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

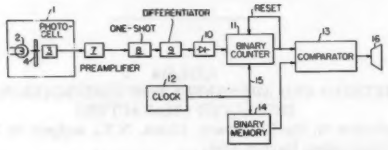
Division of Ser. No. 715,827, Aug. 19, 1976, Pat. No. 4,104,621. This application May 9, 1978, Ser. No. 904,234

Claims priority, application Japan, Aug. 20, 1975, 50-101610; Sep. 3, 1975, 50-107453

The portion of the term of this patent subsequent to Aug. 1, 1995, has been disclaimed.

Int. Cl.[2] G08B *21/00*; B60R *27/00*

U.S. Cl. 340—576 **4 Claims**



1. A driving assurance system for a wheeled vehicle having a steering wheel, comprising: first means for detecting an angular movement of the steering wheel to generate an electrical pulse for every angular movement exceeding a predetermined value no greater than 10° so that said pulse is generated successively when the angular movement exceeds an integral multiple of said predetermined value, a monostable multivibrator connected to said detecting means to the first one of a series of said generate an output pulse in response to pulses generated by the first means during a continuous steering movement, the period of said monostable multivibrator being greater than the longest interval between successive electrical pulses generated by said first means during a continuous steering movement, and second means for generating a warning signal when the interval between successive ones of said output pulses from said monostable multivibrator exceeds a predetermined value.

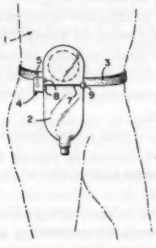
4,224,610
ALARM DEVICE FOR DRAINAGE POUCH

James D. Quinby, 1092 NE. Glass Dr., Jensen Beach, Fla. 33457

Continuation of Ser. No. 688,633, May 21, 1976, abandoned. This application Aug. 14, 1978, Ser. No. 933,377

Int. Cl.[2] G08B *21/00*

U.S. Cl. 340—614 **3 Claims**



1. An alarm device for an incontinence appliance comprising a drainage pouch constructed of a flexible material, said alarm device comprising:

a miniaturized self-contained signalling device having an "on"-"off" switch for turning said miniaturized self-contained signallind device "on" and "off", said miniaturized self-contained signalling device emitting an alarm signal when turned "on" and being quiescient when turned "off" by said "on"-"off" switch; clamping means for detachably securing said miniaturized self-contained signalling device directly to one side of said drainage pouch;

a cable having a first end and a second end, said cable being so positioned relative to said pouch such that said cable is in contact with the outer surface of said drainage pouch;

means to secure said first end of said cable to said "on"-"off" switch, and

means to secure said second end of said cable, relative to said drainage pouch and said miniaturized self-contained signalling device, in such a manner that said cable exerts a pulling force on said "on"-"off" switch to turn said "on"-"off" switch to its "on" position when said drainage pouch becomes filled to approximately its maximum capacity, thereby causing said signalling device to emit an alarm signal indicating that said drainage pouch has become filled to approximately its maximum capacity.

4,224,611
SMOKE ALARM STATION

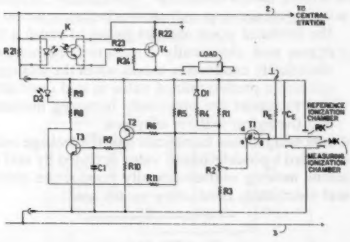
Wolfgang Münstedt, Goffineweg 11, 5 Köln 80, Fed. Rep. of Germany

Filed Mar. 24, 1978, Ser. No. 890,710

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1977, 2713280

Int. Cl.[2] G08B *17/10*

U.S. Cl. 340—629 **9 Claims**



1. In a fire alarm system having a central control station and a plurality of remote smoke alarm stations connected, respectively, to the control station by a pair of supply conductors for delivering a direct current voltage, a combination comprising in each of said alarm stations a smoke sensor including a reference ionization chamber and a measuring ionization chamber, said chambers being connected in series between said supply conductors and having a common intermediate electrode, a field effect transistor having a source, a drain and a gate, said gate being connected to said intermediate electrode, and a conductive channel between said source and drain being controlled by said gate, said source and said drain being coupled to said supply conductors in such a manner that the input capacitance and the input resistance of said field effect transistor are parallel to said reference ionization chamber and define therewith a relatively long first time constant; a two stage switching amplifier coupled between said supply conductors and having an input and an output, said input being controlled by said conductive channel and having an input resistance; an integrating capacitor coupled to said input resistance of said switching amplifier to define therewith a second time constant which is shorter than said first time constant; and indicating means coupled to said output of the switching amplifier to indicate the operative condition of said alarm station.

4,224,612

MONITORING THE CONDITION OF AN INSULATOR

Roy E. Macey, Stand 315, Church St., Johannesburg North, Randburg, Transvaal Province, South Africa

Filed May 12, 1978, Ser. No. 905,606

Claims priority, application South Africa, May 12, 1977, 77/2847

Int. Cl.[2] **G08B** *21/00*

U.S. Cl. 340—647 **11 Claims**

1. A device for monitoring a condition of power transmission line insulators on a power line pylon comprising

an electrically conductive element for connecting to the power line pylon,

electrically conductive means for connection to an insulator at a point insulated from the power line pylon,

sensing means connected between said electrically conductive element and said electrically conductive means for carrying in a conductive path with said electrically conductive element and said electrically conductive means, substantially all of the leakage current between the insulated point and the pylon to electrically bypass the insulation between the insulated point and the pylon,

said sensing means including

severing means responsive to the leakage current between the insulated point and the pylon to cause a break between said electrically conductive element and said electrically conductive means when the leakage current exceeds a predetermined value in said conductive path and to render the previously bypassed insulated point and the pylon without a bypass,

and indicating means to indicate that the leakage current has exceeded a predetermined value actuated by said severing means moving said electrically conductive element and said electrically conductive means apart.

4,224,613

WARNING SYSTEM FOR PRINTING PRESSES

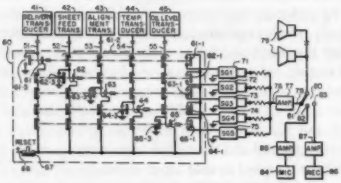
Werner Kaiser, Offenback-Rumpenheim, and Harry Greiner, Offenbach am Main, both of Fed. Rep. of Germany, assignors to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 1, 1978, Ser. No. 965,599

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1977, 2754040

Int. Cl.[3] **G08B** *19/00*

U.S. Cl. 340—679 **7 Claims**



1. A warning system for a printing press having a control station and designed for operation under a given set of simultaneously desired running conditions comprising, in combination, a plurality of remote condition transducers responsive to a respective condition and each having means for producing an output control signal when its condition is departed from, a plurality of acoustic signal generators coupled to the respective transducers for energization by a control signal therefrom, each of the signal generators including means for generating an acoustic signal which has distinctive quality as compared to all of the other acoustic signals, and common loudspeaker means coupled to all of the signal generators and located in the neighborhood of the control station for sounding an acoustic signal from an energized one of the signal generators, the distinctive quality of the signal serving to promptly inform the operator of the press which of the running conditions has been departed from so that corrective action may be taken.

4,224,614

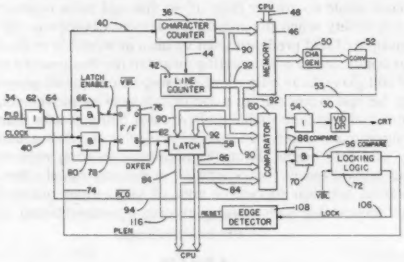
METHOD AND APPARATUS FOR VERIFICATION OF DISPLAYED CHARACTERS

Rathindra N. DevChoudhury, Ithaca, N.Y., assignor to NCR Corporation, Dayton, Ohio

Filed Jan. 9, 1978, Ser. No. 868,109

Int. Cl.[2] **G06F** *3/14*

U.S. Cl. 340—707 **11 Claims**



1. A displayed image detection system comprising in combination:

means for generating signals representing the location of an indicia image to be displayed;

a cathode ray tube including video drive means coupled to said signal generating means for displaying the formation of a plurality of indicia images on the screen of the cathode ray tube in response to the generation of said signals;

an optical light transducer positioned adjacent said cathode ray tube for detecting one of said indicia images, said transducer being responsive to the detection of said indicia images for generating a first control signal in response to said detection;

means coupled to said signal generating means and to said transducer for storing the signals outputted by said signal generating means in response to the generation of said first control signal;

means responsive to the storing of the output of said signal generating means for generating a second control signal;

first logic means coupled to said video drive means and responsive to the generation of said second control signal to reverse the intensity level of the normal display formation of the detected indicia image on the screen of said cathode ray tube to provide a visual indication that said selected indicia image has been detected;

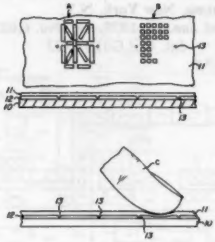
and second logic means responsive to the generation of said second control signal for disabling said storing means from storing the signal output of said signal generating means.

4,224,615

METHOD OF USING A LIQUID CRYSTAL DISPLAY DEVICE AS A DATA INPUT DEVICE

Perry A. Penz, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 14, 1978, Ser. No. 942,226
Int. Cl.[3] G02F 1/13; G06K 15/18
U.S. Cl. 340—712 **13 Claims**



1. A method of inputting information to a liquid crystal display device, said device having a plurality of segments suitable for outputting information and a flexible front substrate, said method comprising:

activating selected segments of the liquid crystal display device to define selected areas where a human operator may input information to the liquid crystal display device by depressing the flexible front substrate thereof;

inputting information to the liquid crystal display device by selectively depressing a portion of the flexible front substrate associated with a particular activated selected area to change the impedance between at least one segment pair in the particular activated selected area corresponding to the depressed portion of the flexible front substrate;

sensing the impedance between at least one segment pair in each of the activated selected areas; and

determining the particular activated selected area corresponding to the portion of the flexible front substrate as selectively depressed by sensing an impedance change between at least one segment pair in the particular activated selected area corresponding to the depressed portion of the flexible front substrate.

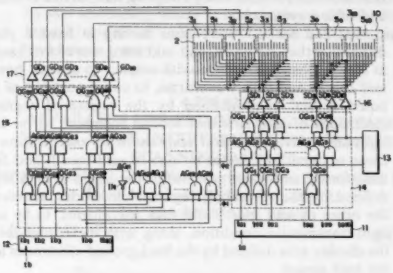
4,224,616

LUMINESCENT ANALOG-DISPLAY DEVICE DRIVEN IN RESPONSE TO TWO OUT OF PHASE TIMING PULSES

Toshio Kamagata, and Takao Kishino, both of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Chiba, Japan

Filed Jul. 17, 1978, Ser. No. 925,681
Claims priority, application Japan, Sep. 22, 1977, 52-113249
Int. Cl.[2] G06F 3/14
U.S. Cl. 340—753 **7 Claims**

1. In a luminescent analog-display device for displaying a numerical information input in an analog fashion, having a multiplicity of segment anodes arranged in a predetermined direction and each coated with a luminescent material layer which emits light when bombarded with electrons, said segment anodes being divided into a plurality of consecutive groups each containing a predetermined number of the segment anodes, said segment anodes being provided so that those disposed at corresponding positions in said groups are electricaly connected in common respectively, and control electrodes provided independently of one another for the respective groups, the improvement which comprises a timing-pulse generating section for generating first and second timing pulses out of phase with each other, segment-anode selecting and driving sections for selectively giving a driving signal in response to said first timing pulse so that the number of the segment anodes to which the driving signal is given corresponds to the numerical value of the least significant digit of said numerical information input and for giving a driving signal to all of said segment anodes in response to said second timing pulse, and control-electrode selecting and driving sections for giving a driving signal in response to said first timing pulse to the control electrode corresponding to the group for representing the numerical value of the least significant digit of said numerical information input and also for giving a driving signal in response to said second timing pulse to the control electrodes associated with the groups containing all the segment anodes corresponding to the numerical value of the higher-column significant digits of said numerical information input.

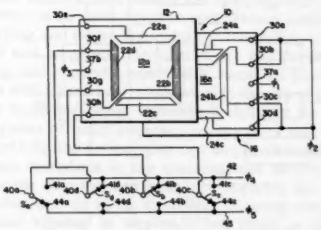


4,224,617

LIQUID CRYSTAL DISPLAY

Charles R. Stein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 23, 1978, Ser. No. 936,020
Int. Cl.[2] G02F 1/13
U.S. Cl. 340—765 **23 Claims**



1. A liquid crystal display comprising:

a layer of liquid crystal material, having opposed front and rear surfaces;

a first member adjacent said rear surface and including at least one conductive segment electrode and a conductive background electrode surrounding and insulated from said at least one segment electrode;

a second member adjacent the front surface of said layer and including a like number of conductive segment electrodes, each in registration with an associated segment electrode of said first member, and a conductive background electrode surrounding and insulated from all of the segment electrodes;

each of said first and second members having contact means associated with each of said at least one segment electrode;

each member having lead means for coupling each segment electrode of that member to its associated contact means, each lead means being so positioned as to be in registration

only with a portion of the background electrode of the opposite member;

first means for continuously coupling first, second and third waveforms respectively to the first member background electrode, all of said second member segment electrodes, and said second member background electrode; and

means connected to each of said segment electrodes of said first member for selectively coupling thereto one of fourth and fifth waveforms;

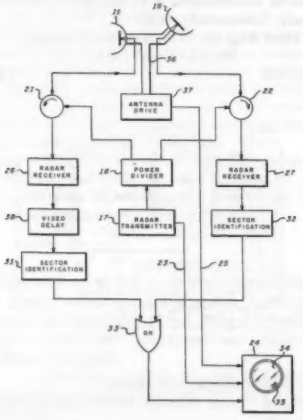
said first and second waveforms having at least a phase difference therebetween, and said third waveform having at least a phase difference with respect to at least one of said fourth and fifth waveforms, to cause portions of the liquid crystal layer defined by the registered segment electrodes of said first and second members to be in a light-absorptive condition responsive to energization of those segment electrodes by one of said fourth and fifth waveforms, and other portions of the liquid crystal layer defined by the remaining segment electrodes, receiving the other of said fourth and fifth waveforms, to be in a light-transmissive condition, along with the remainder of the display area defined by the background electrodes and the lead means.

4,224,618

RADAR SYSTEM WITH A MULTIPLICITY OF ANTENNA BEAMS FOR ELEVATION COVERAGE

Lewis C. Rich, Jamaica; Julius V. DiFranco, Dix Hills, and Robert J. Timms, Glen Head, all of N.Y., assignors to Sperry Corporation, New York, N.Y.

Filed Dec. 11, 1978, Ser. No. 968,243
Int. Cl.[2] G01S 7/20
U.S. Cl. 343—5 EM **6 Claims**



1. In a radar system of the type including a multiplicity of antennas mounted for elevation scanning and azimuthal rotation, transmitter means and receiver means coupled thereto, and radar indicator means coupled to said receiver means, the improvement which comprises:

means coupled to receive video signals from said receiver means for generating identification signals to identify video signals derived from target echo signals received by each of said multiplicity of antennas:

means for coupling said identification signals generated by said identification generator means to said radar indicator means whereon video representative of echo signals received by each of said multiplicity of antennas are displayed and identified; and

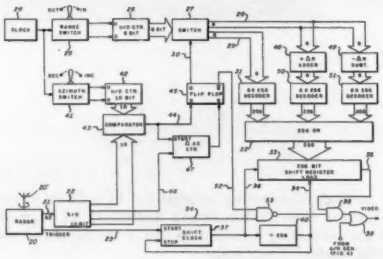
synchronizing means coupled to receive video signals and to generate therefrom video signals for affecting video displays consistent with the temporal azimuthal angular displacement between antennas of said multiplicity of antennas.

4,224,619

SYMBOLOGY WRITING APPARATUS FOR RADAR PLAN POSITION INDICATOR DISPLAYS

Donald E. Bean, Ruckersville; John R. Grymes, Jr., Orange, and Reuben E. Maine, Charlottesville, all of Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 26, 1979, Ser. No. 6,612
Int. Cl.[3] G01S 7/22
U.S. Cl. 343—5 EM **40 Claims**



1. Apparatus for writing symbology on a display face of cathode ray tube means of plan position indicator means of a radar system, said plan position indicator means having writing means for writing on said display face and including a video input to control intensification of said display face, said writing means using range sweeps rotatably scanning in azimuth for writing radar returns on said display face, said apparatus writing said symbology on said display face via said writing means in radar real time, comprising

symbology data generating means for generating data signals required to intensify said display face along said range sweeps at quantized range locations therealong to write said symbology on said display face, and

means for serially applying said data signals to said video input in synchronism with said range sweeps to intensify said display face at said quantized range locations in accordance with said data signals,

thereby writing said symbology on said display face via said writing means in radar real time,

said writing means including beam deflection means for generating a rotating beam deflection field, said beam deflection means including means for generating said range sweeps whereby said range sweeps scan in azimuth,

said symbology data generating means comprising means for generating parallel digital bit signals corresponding to said quantized range locations, respectively, in accordance with said symbology to be written on said display face,

said means for serially applying said data signals comprising parallel-to-serial converter means responsive to said parallel digital bit signals for serially applying said bit signals to said video input in synchronism with said range sweeps to intensify said display face at said quantized range locations in accordance with the binary value of said bit signals.

4,224,620

APPARATUS FOR DETECTING ECHO SIGNALS

Ole S. Seiersen, Kokkedal, Denmark, assignor to Christian Rovsing A/S, Ballerup, Denmark

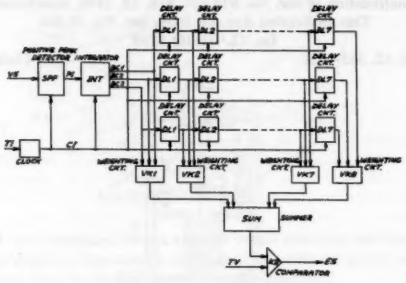
Continuation-in-part of Ser. No. 780,448, Mar. 23, 1977, Pat. No. 4,148,025. This application Feb. 6, 1979, Ser. No. 9,822
Claims priority, application Denmark, Mar. 24, 1976, 1296/76
Int. Cl.[2] G01S 9/02
U.S. Cl. 343—5 VQ **4 Claims**

1. Apparatus for detecting echo signals produced by reflec-

tion of pulses transmitted with a given time period T and a given pulse width τ, said apparatus comprising:

(a) means for determining signal positions with resolution of t/M, where t is essentially equal to the pulse width τ and M is at least 3;

(b) means for producing, for each signal position ascertained, a secondary signal in a corresponding resolution interval of t/M;



(c) means for storing information signals indicating the presence or absence of secondary signals in each of a predetermined number of resolution intervals, spaced by the radar pulse period T;

(d) delay means for phase displacing said information signals by up to a given number of resolution intervals;

(e) means for weighting the undelayed information signal, as well as each of said phase displaced information signals, dependent on the amount of its phase displacement; and

(f) means for summing the weighted information signals.

4,224,621

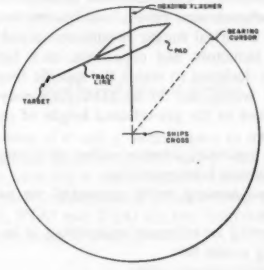
PPI DISPLAY FOR RADAR AND SYNTHETIC SYMBOLOGY

Johnny A. Cornett; Howard S. Gentry, both of Earlysville; Wilfred M. Seay; Terry A. Tucker, both of Charlottesville, and Donald J. Wigent, Earlysville, all of Va., assignors to Sperry Corporation, New York, N.Y.

Filed Jun. 25, 1979, Ser. No. 51,937

Int. Cl.[2] G01S *7/22*

U.S. Cl. 343—5 EM **19 Claims**



1. In a radar system including an antenna scannable in azimuth for receiving radar return data, apparatus for displaying said radar return data, comprising

radar data memory means for storing radar return data corresponding to a complete scan of said antenna,

display means including a display face,

rotating scan generation means coupled to said display means for generating a PPI display scan with respect to said display face rotating at a rate independent of the azimuth scanning rate of said antenna,

addressing means for addressing said radar data memory means in synchronism with the generation of said PPI display scan for providing said radar return data stored therein, and

means for applying said stored radar return data addressed by said addressing means to said display means for displaying said addressed radar return data in synchronism with said rotating scan.

4,224,622

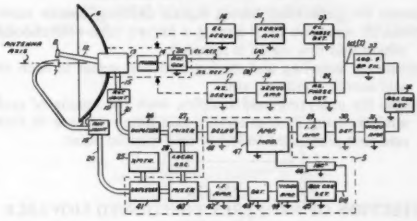
APPARATUS FOR ELIMINATING AMPLITUDE MODULATION INTERFERENCE IN CONICALLY SCANNING RADARS

Jerry D. Schmidt, 7363 New Horizon Ave., Enon, Ohio 45323

Filed Aug. 3, 1971, Ser. No. 168,738

Int. Cl.[3] G01S *7/36, 13/68*

U.S. Cl. 343—7.4 **3 Claims**



1. In a radar tracking system having a directional antenna providing a conically scanning lobe, a receiving circuit including a detector for receiving return pulses of radio frequency energy from a target via said scanning lobe and for deriving their amplitude modulation, antenna aiming circuits associated with said antenna, and means for applying said amplitude modulation as an error signal to said antenna aiming circuits for tracking said target, apparatus for eliminating any component of said amplitude modulation not due to said conical scanning, said apparatus comprising: means for providing said antenna with a fixed lobe symmetrical to the axis of the conical scan, a receiving circuit including a detector for receiving return pulses of radio frequency energy from said target via said fixed lobe and for deriving their amplitude modulation, an amplitude modulator in the scanning lobe receiving circuit prior to the detector, and means for applying the amplitude modulation derived in the fixed lobe receiving circuit to said modulator adjusted in amplitude and phase as required to produce an amplitude modulation of the pulses received via said scanning lobe that is equal in amplitude and opposite in phase to said component, thereby cancelling said component.

4,224,623

LORAN-C CYCLE DETECTOR

William R. Mercer, Belmont, Mass.; William C. Wurst, Amherst, and Lester R. Brodeur, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Jun. 26, 1978, Ser. No. 918,751

Int. Cl.[2] G01S *1/24*

U.S. Cl. 343—103 **8 Claims**

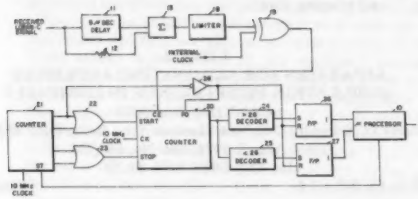
1. Apparatus used in locating a specific cycle zero crossing of received radio frequency signal pulses comprising:

a first transmission means to which said signal pulses are applied to be scaled in amplitude by a known scaling factor before being output therefrom;

a second trasmission means to which said radio frequency signal pulses are applied to be delayed in time before being output therefrom, the amplitude of said signal pulses output from said second transmission means being different

than the amplitude of said signal pulses output from said first transmission means;

means for algebraically combining the signals output from said first and said second transmission means to produce a first radio frequency signal having a phase reversal caused by the unequal amplitudes of the signal pulses input thereto, said phase reversal used to locate a first point of each received signal pulse,



means for generating timing signals defining one or more search windows each having a known time reference in which said first signal is sampled;

means for sampling and storing said first signal in each of said search windows; and

means for analyzing said samples, with the results of said analysis being used to modify said time reference to find said first point used to locate said specific point.

4,224,624

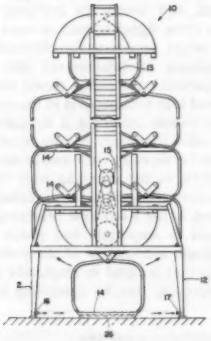
DETECTION OF PROPERLY POSITIONED MOVABLE OBJECTS

Edward N. Evans, Long Beach, Calif., assignor to Park Mobile, Inc., New York, N.Y.

Filed Oct. 26, 1978, Ser. No. 954,823

Int. Cl.[2] G01S *3/02*

U.S. Cl. 343—112 R **20 Claims**



1. An electromagnetic radiation position detection system for detecting when a movable object is located at a predetermined position, said system comprising

a source of polarized electromagnetic microwave radiation fixed relative to the movable object;

means, located on the movable object, for changing the polarization of the electromagnetic radiation;

detector means spaced from said source and fixed relative to the movable object for receiving radiation having said changed polarization such that substantially only that radiation which is detected and such that the polarization of said radiation is changed only when the object is in the predetermined position; and

a waveguide rigidly attached to the object for propagating said microwave radiation, said waveguide extending between, but spaced from said source and said detector means when the object is located at the predetermined position.

4,224,625

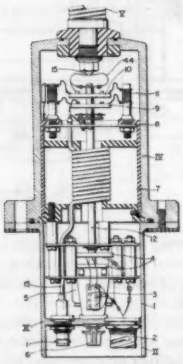
ANTENNA

Maurice M. Peretz, St. Ramat-Gan, and Yhiel Haimovich, Nes Ziona, both of Israel, assignors to Elbit Computers Ltd., Haifa, Israel

Continuation of Ser. No. 879,927, Feb. 22, 1978, abandoned. This application Apr. 24, 1979, Ser. No. 32,804

Int. Cl.[2] H01Q *9/18*

U.S. Cl. 343—750 **11 Claims**



1. An antenna coupler system and whip comprising:

A. a lower housing having a base being provided with connecting means for a vehicle; said housing containing a control unit comprising:

(i) a mechanical and electrical means connectable to a communication set;

(ii) a remote control multipin-connector;

(iii) a RF connector;

(iv) a control motor;

(v) a relay; and

(vi) two rotary selection wafers;

said housing being connected via a flange to,

B. a second housing comprising:

(i) a helical-re-entrant-cavity resonator the parameters of which match an electronic tune system;

(ii) an electronic tune system, said system comprising:

(a) ten electrical tuning circuits composed of shorted line, inductors, and capacitors, each tuning circuit being designed to match the specific frequency sub-band within the 30–80 MHz frequency band and adjusted to the pre-selected height of the whip antenna;

(b) two top rotary selector wafers each arranged at one end of said tuning circuits;

said second housing being connected via an insulating bushing to

C. a base spring arrangement comprising at its upper end connecting means for

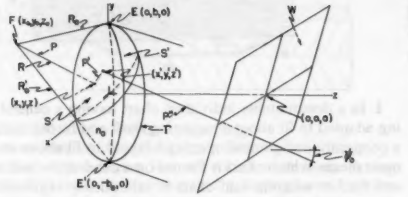
D. a removable antenna whip;

wherein both housings comprise a common rotatable axis which is located in the line of symmetry of the housings and antenna whip system; said rotatable axis being actuated by a control motor which comprises the mechanical link between the rotary selector wafers in both housings; the RF connector in the control unit being connected by way of a 50 ohms RF coaxial-line to the first rotary switch wafer of the electronic tune system; the shield of a section of the coaxial-line constituting the helical coil of the re-entrant-cavity resonator.

4,224,626
ELLIPTICIZED LENS PROVIDING BALANCED ASTIGMATISM

Robert L. Sternberg, Noank, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 10, 1978, Ser. No. 949,711
Int. Cl.[2] H01Q *15/08*
U.S. Cl. 343—911 R **14 Claims**



1. An ellipticized singlet azimuth versus elevation optimized and aperture extremized nonspherical lens with surfaces S and S' specified by the partial differential equations

$$S: \frac{\partial z}{\partial x} = F(A) \quad \frac{\partial z}{\partial y} = G(A),$$

$$S': \frac{\partial(z',y')}{\partial(x,y)} = F'(A)\frac{\partial(x',y')}{\partial(x,y)}, \frac{\partial(x',z')}{\partial(x,y)} = G'(A)\frac{\partial(x',y')}{\partial(x,y)},$$

the symmetry conditions

$$z(-x,y) = z(x,y), \quad z'(-x',y') = z'(x',y'),$$
$$z(x,-y) = z(x,y), \quad z'(x',-y') = z'(x',y'),$$

and the boundary conditions

$$z(x,y)=z'(x,y)=0,$$

on the ellipse

$$\Gamma:(x^2/b_0^2\cos^2\psi_0)+(y^2/b_0^2)=1$$

where

S and S' are the lens surfaces having functional representations of the forms $z=z(x,y)$ and $z'=z'(x',y')$ wherein x' and y' are themselves functions $x'=x'(x,y)$ and $y'=y'(x,y)$ of the independent variables x and y, $\partial z/\partial x$ and $\partial z/\partial y$ are the partial derivatives of z with respect to the independent variables x and y respectively,

$$\frac{\partial(z',y')}{\partial(x,y)}, \frac{\partial(x',y')}{\partial(x,y)} \text{ and } \frac{\partial(x',z')}{\partial(x,y)}$$

are the Jacobian of z' and y' with respect to the independent variables x and y, the Jacobian of x' and y' with respect to the independent variables x and y and the Jacobian of x' and z' with respect to the independent variables x and y respectively, F(A), G(A), F'(A) and G'(A) are the functions of the arguments $A=(x,y,z,x',y',z')$ defined as

$$F(A) = \frac{n_o(x'-x)p - xp'}{(z-z_o)p' - n_o(z'-z)p},$$

$$G(A) = \frac{n_o(y'-y)p - (y-y_o)p'}{(z-z_o)p' - n_o(z'-z)p},$$

$$F'(A) = \frac{n_o(x'-x)}{p'\cos\psi_o - n_o(z'-z)},$$

$$G'(A) = \frac{n_o(y'-y) + p'\sin\psi_o}{p'\cos\psi_o - n_o(z'-z)},$$

and where p and p' denote the path length elements defined by the expressions

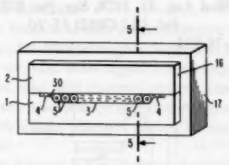
$$p^2=x^2+(y-y_o)^2+(z-z_o)^2, p'^2=(x'-x)^2+(y'-y)^2+(z'-z)^2,$$

and n_o, y_o, z_o and ψ_o are respectively, the index of refraction of the lens material, the y and z coordinates of the finite focal point F and the off-axis angle to the infinite focal point F_∞, Γ is the ellipse bounding the lens formed by S and S' and is defined by the equation shown in which x and y are the independent variables and b_o is the maximum radius of the lens formed by S and S' and the semi-major axis of the ellipse Γ.

4,224,627
SEAL GLASS FOR NOZZLE ASSEMBLIES OF AN INK JET PRINTER

Jimmie L. Powell, and Rao R. Tummala, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 28, 1979, Ser. No. 53,147
Int. Cl.[2] C03C *3/10, 3/16, 3/08*; G01D *15/18*
U.S. Cl. 346—75 **11 Claims**



1. In a multiple ink-jet glass nozzle array embedded in a seal glass mass with the nozzle elements of said array fabricated from a composition consisting essentially, by weight, of

SiO_2	55–58.5%	Al_2O_3	0–1.0%
ZrO_2	17.0–22.5%	CaO	0–2.5%
Na_2O	16.0–17.0%	K_2O	2.0–3.0%
MgO	3.0–5.0%	As_2O_3	0.5%,

the improvement comprising forming said seal glass mass from a vitrified frit having a composition, by weight percent, selected from the group of:

A. a first alkaline resistant formulation of

PbO	[0–56] 45.0–53.5%	[GeO2	0–3%]
SiO_2	[8–25] 15.0–24.5%	ZrO_2	[0.5–6.0] 4.5%
B_2O_3	5-[19] 12%	MgO	[1–2.5] 0.5–1.5%
ZnO	3.5–[9] 4.5%	BaO	0–1.5%
Al_2O_3	[4–8] 3.0–4.0%	TiO_2	[0–2] 0.5–1.5%
Na_2O	1–6.5%	CaO	[0–2] 0.5–1.5%
CdO	[0–67] 2–3%	La_2O_3	0–0.5%
Cu_2O	[1–3] 0–2%;		

said formulation having an expansion coefficient (α at 24°–300° C.) of from about 69.5 to 88.6×10^{-7}/° C., an anneal temperature (T_a) of about 418° to 468° C. and a softening temperature (T_s) of about 529° to 594° C.;

B. a second alkaline resistant formulation of

CdO	56.6–67.0%	MgO	0–2.5%
SiO_2	8–10%	Al_2O_3	4.0–8.0%
B_2O_3	6.9–17.0%	GeO_2	0–3.0%
ZnO	0–9.0%		
Na_2O	0–5.0%		
CaO	0–1.5%; and		

said formulation having an expansion coefficient (α at 24°-300° C.) of from about 75 to 86.1×10^{-7}/° C., an anneal temperature (T_a) of about 471° to 522° C. and a softening temperature (T_s) of about 560° to 622° C.; and C. an acid resistant formulation of

P_2O_5	15-70.0%	Na_2O	0-4.0%
ZnO	14.0-66.4%	SiO_2	0-5.0%
B_2O_3	0-18.3%	ZrO_2	0-2%
Al_2O_3	7-8%	TiO_2	0-1%

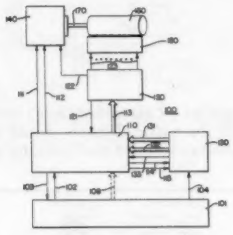
said formulation having an expansion coefficient (α 24°-300° C.) of from about 54.6 to 83.0×10^{-7}/° C., an anneal temperature (T_a) of about 439° to 503° C., and a softening temperature (T_s) of about 563° to 580° C.

4,224,628

GENERAL PURPOSE COMBINED ALPHANUMERIC/GRAPHICS PRINTER

Robert C. Murray, Auburn Heights, Mich., assignor to The Valeron Corporation, Troy, Mich.

Filed Aug. 31, 1978, Ser. No. 938,433
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **14 Claims**



1. A general purpose printer for generating documentation of data supplied thereto by a host system, the printer comprising:

a stationary printhead including a plurality of thermal dot printing elements organized as a linear array for generating dot patterns on a heat-sensitive print medium;

a microcomputer coupled for receipt of digital data from the host system, operative to provide output data of a nonrestrictive format;

first interface means coupled between the microcomputer and the printhead, operative to convert data received from the microcomputer into enabling signals for selected dot printing elements;

stepper motor means having a rotatable member coupled to a roll of heat sensitive paper and drive circuit means coupled to the microcomputer, operative to move the heat sensitive paper relative to the printhead at a rate determined by signals received from the microcomputer; and

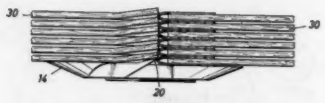
the microcomputer including a microprocessor having associated addressable memory means, addressable peripheral interface adaptor means for coupling the microprocessor to the first interface means, addressable asynchronous communication interface adaptor means for coupling serial input digital data from the host system to the microprocessor, and programmable timer means coupled to the microprocessor, operative to generate timing signals for use by the microprocessor in transmitting step commands via the peripheral interface adaptor means to the stepper motor drive circuit means.

4,224,629

DISC CHART PAPER WITH REINFORCED SEPARATING EDGE

Robert H. Welker, P.O. Box 138, Sugar Land, Tex. 77478

Filed Apr. 20, 1979, Ser. No. 31,753
Int. Cl.³ G01D *15/24*
U.S. Cl. 346—137 **10 Claims**



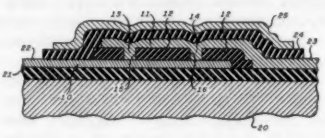
1. In a demountable individual chart having a central opening adapted to fit about a mounting shaft and further including a cooperative alignment opening adapted to fit about an alignment means which chart is for use on a chart drive mechanism and further wherein said chart is azimuthally registered to a selected location by said central and alignment openings and wherein said chart is adapted to be stacked adjacent to a stack of similar charts on said chart drive mechanism and said chart drive mechanism incorporates a rotatable hub having a cutting edge thereon and said cutting edge, on rotation, separates the demountable chart from adjacent similar charts, the improvement which comprises a reinforced shoulder means on said chart which shoulder means is located to engage said cutting edge on said rotatable hub and which shoulder means further enables said cutting edge to rotate relative to said rotatable hub.

4,224,630

MULTIPLE WEAK-LINK SQUID

Harry Kroger, Sudbury, Mass., assignor to Sperry Corporation, New York, N.Y.

Continuation of Ser. No. 836,452, Sep. 26, 1977, abandoned. This application Aug. 25, 1978, Ser. No. 937,014
Int. Cl.² H01L *39/22*
U.S. Cl. 357—5 **11 Claims**



1. A SQUID comprising

first and second layers of superconductive material superposed with respect to each other, and

insulator layer means disposed between said superconductive layers, said insulator layer means having at least two holes therethrough with superconductive material therein forming weak superconducting links between said first and second superconductive layers,

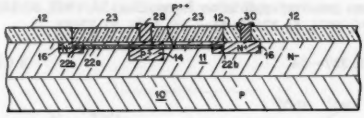
whereby a magnetic field applied to said SQUID causes control of the supercurrent flowing between said first and second superconductive layers,

said SQUID further including control line means proximate said superconductive layers and electrically insulated therefrom for providing a control magnetic field to the area between said weak-links thereby controlling said supercurrent.

4,224,631
SEMICONDUCTOR VOLTAGE REFERENCE DEVICE

Earl C. Vickery; James C. Schmoock, and Clyde M. Brown, Jr., all of San Jose, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed Oct. 25, 1978, Ser. No. 954,390
Int. Cl.[3] H01L *29/90*
U.S. Cl. 357—13 4 Claims

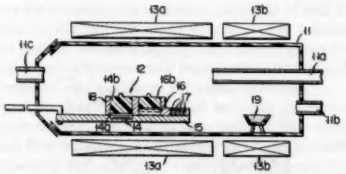


1. A semiconductor device comprising:
(a) a semiconductor body having a first type conductivity;
(b) a first doped region formed within such body having such first type conductivity and a doping concentration greater than the doping concentration of the body, such first region having an inner periphery enclosing a portion of the body;
(c) a second doped region having a type conductivity opposite the first type conductivity formed within the inner periphery of the first region and being separated from the first region by a portion of the semiconductor body, the second doped region having a doping concentration less than the doping concentration of the first doped region;
(d) a region of particles disposed within the body having a peak concentration at a predetermined depth from a surface of the body and extending beneath the surface of the body into the second doped region and into the first doped region, such particles establishing a third doped region having a doping concentration less than the doping concentration of the first doped region, thereby terminating the third doped region at the first doped region, a junction being formed between the third doped region and the first doped region beneath the surface of the body.

4,224,632
GREEN LIGHT EMITTING DEVICE

Masami Iwamoto, Tokyo; Makoto Tashiro, Yokohama; Tatsuro Beppu, Tokyo, and Akinobu Kasami, Yokohama, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 10, 1978, Ser. No. 950,049
Claims priority, application Japan, Oct. 7, 1977, 52/120037; Oct. 7, 1977, 52/120039
Int. Cl.[2] H01L *33/00*
U.S. Cl. 357—17 15 Claims

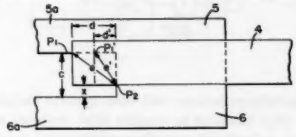


1. In a green light emitting device comprising an n-type GaP substrate, an n-type GaP layer formed on the substrate and a p-type GaP layer formed on the n-type GaP layer, the improvement wherein said n-type GaP layer includes a first layer formed on the GaP substrate and a second layer directly formed on the first layer, said second layer being closer to the p-type GaP layer, the net donor concentration in said first layer being higher than the net donor concentration in said second layer, the donor concentration in said first layer being abruptly decreased to that of said second layer, and said second layer containing nitrogen at a higher concentration than in said first layer.

4,224,633
IGFET STRUCTURE WITH AN EXTENDED GATE ELECTRODE END

Jun-ichi Mogi, Kawasaki; Kiyoshi Miyasaka, and Seiji Enomoto, both of Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed May 23, 1978, Ser. No. 908,835
Int. Cl.[2] H01L *29/78*
U.S. Cl. 357—23 8 Claims

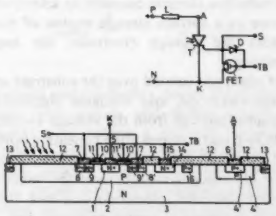


1. An insulated gate field effect transistor comprising:
a semiconductor substrate;
a source region formed in said semiconductor substrate;
a drain region and a channel region formed in said semiconductor substrate, said drain region located opposite to said source region, and said channel region located therebetween, whereby said source and drain regions define the channel width of the channel region of said field effect transistor; and
a gate electrode having a first portion formed on top of a first insulating layer formed on top of said semiconductor substrate between said souce and drain regions, said first portion of said gate electrode defining the channel length of the channel region of said field effect transistor, and said gate electrode having an extended end portion formed on top of a second insulating layer, the length of said extended end portion is selected whereby the length of a diagonal line, beginning at the intersection of the end of the extended end portion of said gate electrode and said source region and ending at the intersection of said gate electrode and the end of said drain region, is not less than the width of said gate electrode.

4,224,634
EXTERNALLY CONTROLLED SEMICONDUCTOR DEVICES WITH INTEGRAL THYRISTOR AND BRIDGING FET COMPONENTS

Per Svedberg, Vällingby, Sweden, assignor to ASEA Aktiebolag, Vesteras, Sweden

Filed Jun. 1, 1976, Ser. No. 691,618
Claims priority, application Sweden, Jun. 19, 1975, 7507080
Int. Cl.[2] H01L *29/74*
U.S. Cl. 357—38 7 Claims



1. Semiconductor device of the type controlled by an exter-

nal input comprising a semiconductor body with four layers of alternately P and N conducting types, which layers constitute a thyristor including means responsive to said external input for controlling the thyristor, the two outermost of said layers forming emitter junctions with adjacent layers, the semiconductor body comprising an integrated metal oxide field effect transistor part bridging at least one of the emitter junctions for controlling ignition and turn-off of the thyristor, and having a source and a drain, the source and drain of the field effect transistor comprise regions of the same conductivity type, one of these regions comprising the emitter layer adjacent to the bridged emitter junction and the other region comprising a region ohmically connected to the layer adjacent to the emitter layer and of the same type of conductivity as the emitter layer.

4,224,635

DYNAMIC STORAGE ELEMENT HAVING STATIC STORAGE ELEMENT BEHAVIOR

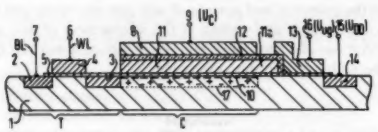
Manfred Mauthe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 7, 1978, Ser. No. 922,747

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1977, 2734354

Int. Cl.[2] **H01L** *27/02, 29/78, 29/34;* **H03K** *5/00*

U.S. Cl. 357—41 **6 Claims**



1. In a storage element of the type which comprises a storage capacitor including a storage electrode arranged over and insulated from a doped semiconductor substrate of one conductivity type and connected to a constant voltage, and comprising a selection element which includes a gate electrode connected to a word line arranged insulated above the substrate and an doped source zone of the opposite conductivity type connected to a bit line and arranged at a surface of the substrate, the selection element operable to selectively connect the source zone to a surface storage region of the substrate located beneath the storage electrode, the improvement therein comprising:

an insulated electrode carried over the substrate and beneath the storage electrode, said insulated electrode insulated from the substrate and from the storage electrode,

an additionally p and n doped zone beneath a portion of said insulated electrode adjacent the selection element,

an overflow electrode arranged over the substrate on the side of said insulated electrode opposite the selection element for receiving a control potential, and

an oppositely doped overflow drain zone in the substrate at said surface adjacent said overflow electrode.

4,224,636

SEMICONDUCTOR DEVICE WITH THERMALLY COMPENSATING SiO_2–SILICATE GLASS–SIC PASSIVATION LAYER

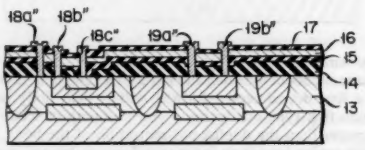
Toshio Yonezawa, Yokosuka; Takashi Ajima, Tokyo, and Masato Uchida, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Continuation of Ser. No. 753,444, Dec. 22, 1976, abandoned. This application Jun. 14, 1978, Ser. No. 915,542

Claims priority, application Japan, Dec. 24, 1975, 50-153379; Mar. 16, 1976, 51-27650; Mar. 16, 1976, 51-27651

Int. Cl.[2] **H01L** *29/34*

U.S. Cl. 357—54 **8 Claims**



1. An improved semiconductor device of the type including a semiconductor substrate with an outwardfacing surface having a plurality of P-N junctions disposed thereon, and an electrically insulating film covering each of the junctions, the insulating film including a layer of silicon dioxide formed directly on the substrate surface, the silicon dioxide having a characteristic coefficient of thermal expansion differing from that of the substrate, the improvement comprising film means selected for accommodating thermal stresses produced in the insulating film during significant temperature changes and for protecting the substrate and the insulating film from externally-incident contamination, said film means being formed on and substantially covering the insulating film and the substrate surface, said film means including a silicon carbide film and a silicate glass film selected from the group consisting of P-SG, P.As-SG, P.B-SG and P.Sb-SG, where SG means "silicate glass," said silicate glass film being formed between said silicon carbide film and the insulating film, and wherein said silicate glass film and said silicon carbide film cover substantially all the surface.

4,224,637

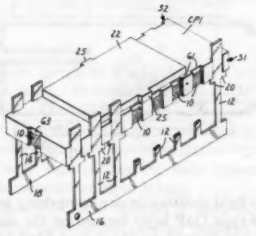
LEADED MOUNTING AND CONNECTOR UNIT FOR AN ELECTRONIC DEVICE

Billy M. Hargis, Hugo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 10, 1978, Ser. No. 932,609

Int. Cl.[2] **H01L** *23/02, 23/12, 39/02*

U.S. Cl. 357—74 **13 Claims**



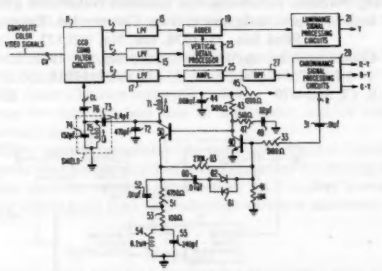
1. An improved mounting and connector unit for an electronic device or devices, the unit including a structure having two parallel opposed sides and a plurality of metallized areas; a plurality of spaced metallized areas positioned on both of the two parallel sides and making connection with any of the

plurality of metallized areas which extend to the spaced metallized areas; two sets of a plurality of terminal leads, one set for each of the opposite sides with each of the leads physically are electrically bonded to a different one of the spaced metallized areas and extending from the structure in the same general direction; a tie bar, one for each of the two sets of terminal leads, joining the terminal leads at one end, the improvement wherein at least one of the terminal leads for each of the two sets have a straight, flat portion that extends beyond said parallel sides in the direction away from the tie bars.

4,224,638
FREQUENCY MULTIPLIER FOR USE WITH CCD COMB FILTER

Dalton H. Pritchard; Walter E. Sepp, both of Princeton, N.J., and William A. Lagoni, Indianapolis, Ind., assignors to RCA Corporation, New York, N.Y.

Filed May 11, 1979, Ser. No. 38,291
Int. Cl.[2] H04N 9/535; H03B 19/14
U.S. Cl. 358—31 **5 Claims**



1. Frequency multiplier apparatus comprising, in combination:

a first amplifying stage including a first transistor having base, emitter and collector electrodes and disposed in a common-emitter amplifier configuration;

means for applying input signals of a given frequency to the base electrode of said first transistor;

a second transistor having a base, emitter and collector electrodes;

means for coupling the collector electrode of said first transistor to the base electrode of said second transistor;

a first parallel resonant circuit tuned to said given frequency and coupled between said emitter electrode of said second transistor and a point of reference potential;

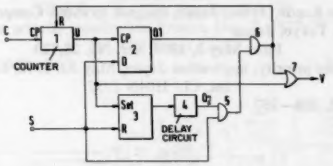
a signal feedback path coupled between the emitter electrode of said second transistor and the base electrode of said first transistor, said signal feedback path exhibiting a relatively high impedance during zero crossovers of said input signals and a relatively low impedance during intervals intervening said zero crossovers of said input signals; and

a narrow-band, frequency selective load circuit for said second transistor coupled to the collector electrode of said second transistor and including a second parallel resonant circuit tuned to a selected harmonic of said given frequency, said selected harmonic frequency corresponding to a given odd integral multiple, different from one, of said given frequency.

4,224,639
DIGITAL SYNCHRONIZING CIRCUIT

Pietro Belisomi, Pinerolo, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Filed Mar. 3, 1978, Ser. No. 883,237
Claims priority, application Italy, Mar. 3, 1977, 67463 A/77
Int. Cl.[2] H04N 5/04
U.S. Cl. 358—158 **11 Claims**

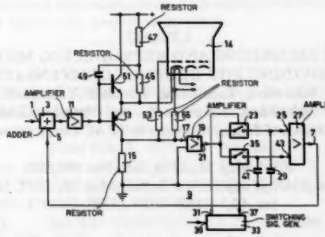


1. A circuit arrangement for vertical synchronization of a television receiver with respect to received sync signals, the arrangement comprising a frequency divider connected to receive pulses derived from an incoming line frequency signal to generate vertical sync pulses, a circuit for detecting coincidence between the vertical sync pulses generated by the divider and received vertical sync pulses included in a synchronization signal, which may include additional spurious pulses, a further circuit operative to forward only one pulse among the pulses included in said synchronization signal during each vertical deflection cycle said pulse being sent to a control circuit connected both to the coincidence detecting circuit and to the said further circuit, said control circuit producing a pulse indicative of any phase error between the generated and the received vertical sync pulses for resetting the divider to rephase the generated vertical sync pulses for synchronism with the received vertical sync pulses.

4,224,640
CRT BEAM CURRENT CONTROL APPARATUS

Paulus J. M. Hovens; Miloslav Tryzna; Wouter Smeulers, and Willem H. Amsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 22, 1978, Ser. No. 972,590
Claims priority, application Netherlands, Jan. 25, 1978, 7800870
Int. Cl.[2] H04N 5/68
U.S. Cl. 358—242 **6 Claims**



1. A television picture display device for displaying pictures derived from video signals, said display device comprising a picture display tube having a cathode; an emitter-follower device coupled to said cathode for producing a beam current for driving said picture display tube; a beam current reference level control circuit coupled to said emitter-follower device for controlling the black level of the beam current; a blacker-than-black current compensation circuit incorporated in said beam current reference level control circuit for compensating

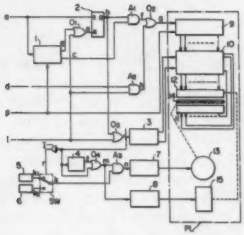
for a leakage current in said cathode caused by a blacker-than-black level in the video signal; and a blacker-than-black current conduction circuit coupled to said cathode to enable compensation of said leakage current when said beam current is blanked.

4,224,641

ABNORMALITY INDICATION SYSTEM OF FACSIMILE APPARATUS

Hajime Kanda, Ayase, Japan, assignor to Ricoh Company, Limited, Tokyo, Japan

Filed May 3, 1979, Ser. No. 35,720
Claims priority, application Japan, May 12, 1978, 53/55552
Int. Cl.[2] H04N *1/32*
U.S. Cl. 358—257 **7 Claims**



1. An abnormality indication system of a facsimile apparatus comprising:

a recording sheet,

a recording means for recording information on said recording sheet,

an information producing means for producing information indicating an abnormality of said facsimile apparatus,

a change-over means for changing over information to be applied to said recording means from an original image information to said information indicating an abnormality of said facsimile apparatus, which is produced by said information producing means at the time of hang-up of said facsimile apparatus, and

a recording stop and recording sheet discharge means for stopping the recording of information and discharging said recording sheet from said facsimile apparatus when the production of said information indicating an abnormality of said facsimile apparatus by said information producing means is terminated.

4,224,642

PCM RECORDING AND REPRODUCING METHOD PROVIDING FOR DROPOUT COMPENSATION

Akinori Mawatari, Tachikawa; Hirohisa Yamaguchi, Tokyo; Kenji Nakamura, Tokorozawa, and Satoshi Uchiumi, Tachikawa, all of Japan, assignors to TEAC Corporation, Tokyo, Japan

Filed May 11, 1978, Ser. No. 904,892
Claims priority, application Japan, May 18, 1977, 52/57488
Int. Cl.[2] G11B *5/00, 15/02, 5/09*
U.S. Cl. 360—32 **15 Claims**

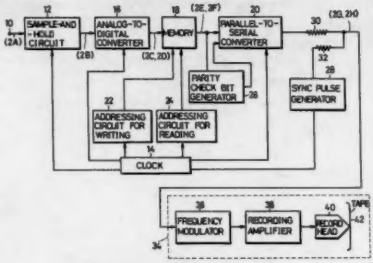
1. In a method of recording and reproducing an analog signal by a pulse-code modulation scheme, the steps of:

(a) sampling the analog signal at regular intervals;

(b) converting the samples of the analog signal into a sequence of words of parallel bit format in accordance with a prescribed code of pulses;

(c) dividing the words of each of successive word blocks, each word block composed of a preselected number of the words, into at least two sub-blocks, the words of the sub-blocks of each word block being in at least one-by-one alternation;

(d) converting each word from parallel to serial bit format; and



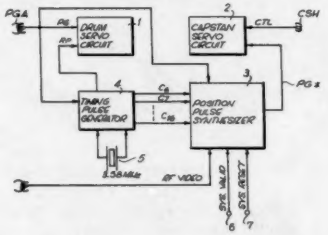
(e) recording the sub-blocks of the successive word blocks in successive regions of a single track on a recording medium.

4,224,643

AUTOMATIC TRACKING SERVO CONTROL SYSTEM

Kenji Nakano, Yokohama, and Tadahiko Nakamura, Kanagawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sep. 25, 1978, Ser. No. 945,121
Claims priority, application Japan, Sep. 26, 1977, 52-114696
Int. Cl.[2] G11B *27/04, 15/46, 5/08*; H02K *27/20*
U.S. Cl. 360—70 **22 Claims**



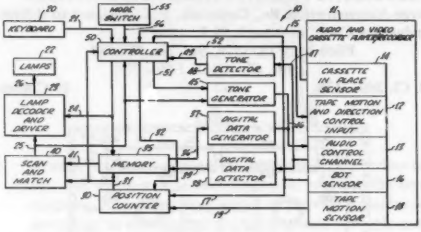
1. In a servo control system of the type adapted to control the tracking of at least one rotary signal transducer which scans successive parallel tracks on a movable record medium and including position pulse generating means for generating position pulses when said at least one transducer rotates into predetermined position with respect to said record medium, means for generating control signals representative of the relative positions of said tracks on said record medium, and control means for controlling the relative position of said at least one transducer with respect to the tracks scanned thereby as a function of said position pulses and said control signals, the improvement comprising detecting means for detecting relative strengths of signals reproduced from said tracks by said at least one transducer; phase shift means for shifting the phase of said position pulses by a selected amount during successive scanning cycles of said at least one transducer; means for periodically adjusting said selected amount by which the phase of said position pulses is shifted in accordance with the detected relative strengths of said reproduced signals; and means for supplying the phase shifted position pulses to said control means for use in controlling said relative position of said at least one transducer with respect to the tracks scanned thereby.

4,224,644

METHOD AND APPARATUS FOR CONTROLLING A TAPE PLAYER/RECORDER FOR RETRIEVING AND PLAYING PRERECORDED INFORMATION

David E. Lewis, Orange, and Victor Blum, Marina del Rey, both of Calif., assignors to Videodetics Corporation, Anaheim, Calif.

Filed Feb. 8, 1978, Ser. No. 876,067
Int. Cl.[2] G11B 15/20, 27/24
U.S. Cl. 360—72.2 43 Claims



1. Apparatus for use with a tape player/recorder having a tape therein having a plurality of audio and/or video selections recorded thereon at spaced locations, said player/recorder including means for providing an indication of tape motion and direction and for generating a signal indicative thereof, comprising:

means responsive to said tape motion and direction indicating signal for generating a number indicative of tape position from a known reference point;

means for selecting any one of said audio and/or video selections; and

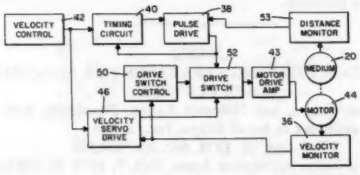
memory means responsive to said tape position number generating means and said selection means for storing the tape position number generated by said number generating means each time said selection means is activated.

4,224,645

METHOD AND APPARATUS FOR CONTROLLING THE MOVEMENT OF A RECORDING MEDIUM

Paul A. Mauch, Mountain View, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Feb. 3, 1978, Ser. No. 874,739
Int. Cl.[2] G11B 15/46
U.S. Cl. 360—73 22 Claims



1. A method for closely controlling the movement of a medium moved by transport means comprising the steps of:

starting the driving of the transport means for a drive interval that will move said medium a predetermined distance, said drive interval being of variable time duration depending upon the speed at which said medium is moved the predetermined distance;

monitoring movement of the medium to determine if said medium has moved said predetermined distance;

controlling the length of said time duration of the drive interval so that the medium moves said predetermined distance; and,

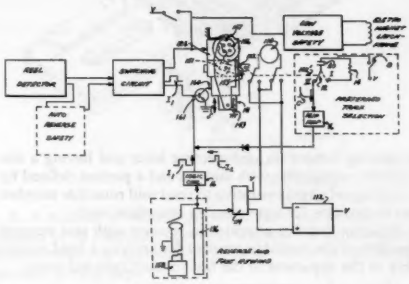
controlling the frequency of said drive intervals to a desired frequency of medium movements of said predetermined distances in accordance with said desired velocity by adjusting the time between drive intervals.

4,224,646

AUTOMATIC PREFERRED TAPE TRACK SELECTION FOR BI-DIRECTIONAL TAPE TRANSPORT

Etienne A. M. Schatteman, Wemmel, Belgium, assignor to Staar, S.A., Brussels, Belgium

Filed Dec. 5, 1978, Ser. No. 966,589
Claims priority, application France, Dec. 9, 1977, 77 37208
Int. Cl.[2] G11B 15/48
U.S. Cl. 360—74.2 3 Claims



1. In a recording and playback apparatus for tapes stored in cassettes, having a bidirectional drive with two states for transporting the tape in either of the two directions from either reel to the other of a cassette, and means including an electrically powered device operable in response to an electrical pulse for reversing said bidirectional drive; the improvement comprising means for controlling said bidirectional drive to move the tape in a preferred direction upon start of the drive, said control means including:

switch means having two states corresponding to the two states of said bidirectional drive, one state of said switch means corresonding to the non-preferred direction of tape movement,

means shifting said switch means between states as said bidirectional drive is reversed by said electrically powered device, and

pulse generating means connected to transmit a pulse through said switch means to said electrically powered device when said switch means is in the non-preferred state upon start of the drive, to reverse the drive and move the tape in the preferred direction.

4,224,647

MAGNETIC TAPE-RECORD/PLAYBACK APPARATUS

Hiroyuki Umezawa; Masao Ito, and Hitoshi Okada, all of Toda, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1979, Ser. No. 10,613
Claims priority, application Japan, Feb. 10, 1978, 53/13621; Feb. 10, 1978, 53/16301; Feb. 13, 1978, 53/15579; Feb. 21, 1978, 53/18081; Feb. 22, 1978, 53/20759
Int. Cl.[2] G11B 15/10, 15/24, 19/26
U.S. Cl. 360—96.3 6 Claims

1. A magnetic tape-record/playback apparatus having a mechanism for fast forward/rewind operation which comprises:

an ejecting lever for removing a magnetic tape;

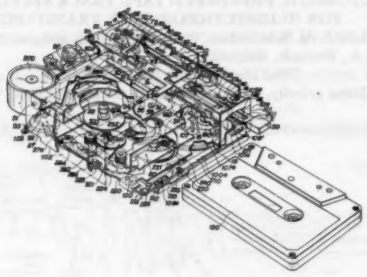
an ejecting plate provided separately from said ejecting lever;

interlocking means for interlocking said ejecting lever and said ejecting plate allowing relative sliding movement therebetween;

a spring provided between said ejecting lever and a frame of

said apparatus to urge said ejecting lever for resetting said lever to its original position;

a rotatable member actuatable to effect a switching operation in association with fast forward/rewind mode and having a pin and a stepped portion formed thereon;



an opening formed on said ejecting lever and having a slot portion engageable with said pin and a portion defined by convergent edges operative to reset said rotatable member to its position for tape ejecting operation; and

an engaging member provided in relation with said stepped portion of the rotatable member for keeping a head assembly of the apparatus in the fast forward/rewind mode.

4,224,648

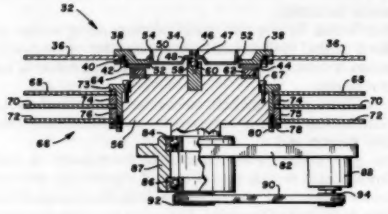
DISC CENTERING

William J. Roling, Richfield, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Oct. 16, 1978, Ser. No. 951,904

Int. Cl.[3] G11B *5/82, 25/04*

U.S. Cl. 360—97 **22 Claims**



1. Apparatus for mounting a hub on a spindle, including:

a rotatable hub, said hub including a circumferencial collar, a centering element at the hub center and extended axially thereof, and connecting means for maintaining said collar in a normal position with respect to said centering element;

a spindle rotatable on a central axis;

means defining a collar-receiving surface integral with said spindle;

a forcing means for urging said collar axially inward toward a full seating against said collar-receiving surface;

means defining a cup in said spindle centered on said central axis and extended radially outward therefrom so as to engage said centering element whenever said hub is at least approximately centered on said spindle, the surface of said cup being inclined radially inward and axially inward thereby to guide said centering element, when in contact therewith, toward said central axis responsive to said forcing means, and then to cradle said centering element once it is centered on said central axis;

said connecting means being substantially rigid radially of said hub, but deformable elastically so as to allow axial displacement of said collar from said normal position with respect to said centering element;

wherein said collar, after the cradling of said centering element, is displaced responsive to said forcing means axially inward from said normal position with respect to said centering element, thereby elastically deforming said connecting means prior to said full seating of said collar against said collar-receiving surface.

4,224,649

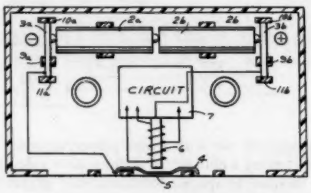
AUTOMATIC CASSETTE HEAD DEMAGNETIZER

George Alexandrovich, Sr., Commack, N.Y., assignor to Robins Industries Corp., Commack, N.Y.

Filed May 10, 1978, Ser. No. 904,581

Int. Cl.[2] G11B *5/46*

U.S. Cl. 360—128 **15 Claims**



1. An automatic electronic demagnetizer unit for tape recorders and playback machines using tape cassettes having standard cassette housings, comprising, in combination, a standard cassette housing insertable into such a machine; and a demagnetizing arrangement inside the standard cassette housing, the demagnetizing arrangement including stationary inductor means so positioned relative to the cassette housing as to direct when energized a magnetic field towards the play head of the machine, a control circuit connected to the inductor means and operative when activated for controlling the energization of the inductor means at a variable frequency to cause the latter to perform a demagnetizing operation, and electrical switch means so positioned in the cassette as to be activated in automatic response to movement of the play head of the machine into normal playback position and operative when so activated for activating the control circuit to thereby initiate the performance of a demagnetizing operation, whereby the demagnetizing operation can be initiated in automatic response to depression of the play button of the cassette machine or analogous activation of an analogous control member on the machine.

4,224,650

CARTRIDGE EJECTING APPARATUS FOR MAGNETIC TAPE PLAYERS

Itsuki Ban, Tokyo, and Hidenori Kanno, Funabashi, both of Japan, assignors to Secoh Giken, Inc., Japan

Filed Aug. 18, 1978, Ser. No. 934,908

Claims priority, application Japan, Oct. 7, 1977, 52/120130

Int. Cl.[2] G11B *19/02, 15/02*

U.S. Cl. 360—137 **15 Claims**

1. An apparatus for automatically removing a tape cartridge from a first position in which a magnetic tape in said cartridge is engaged with a sound reproduction means of a magnetic tape player to a second position in which said tape in said cartridge is clear of said sound reproduction means of said magnetic tape player comprising:

a frame;

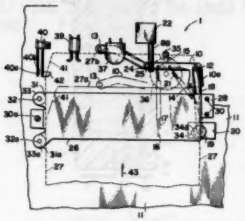
ejecting means mounted on said frame, said ejecting means being movable between a third position in which said cartridge is in said first position and a fourth position in which said cartridge is in said second position;

a movable member for controlling said ejecting means and

operatively connected to said ejecting means, said movable member holding said ejecting means at said third position when in a depressed position and at said fourth position when in a released position;

a magnet;

a ferromagnetic lever pivotally connected to said movable



member and being engageable with said magnet when said movable member is in said depressed position, the ferromagnetic lever being configured to provide a mechanical advantage to said magnet for holding said movable member in said depressed position; and

release means for removing a force of the magnet from said ferromagnetic lever for releasing said movable member.

4,224,651

MONITORING A SIGNAL

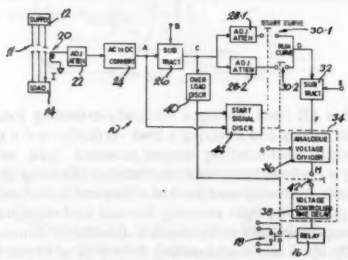
James C. H. Allen; Tobias D. Schonken, and Johan C. Botma, all of P.O. Box 115, Rosslyn 0200, Pretoria, Transvaal Province, South Africa

Filed Mar. 13, 1978, Ser. No. 886,228

Claims priority, application United Kingdom, Mar. 14, 1977, 10744/77

Int. Cl.² H02H *3/08*

U.S. Cl. 361—28 **18 Claims**



1. A method of monitoring an input signal, which comprises dividing a predetermined dividend value by the input signal to provide a quotient signal, integrating the quotient signal with respect to time to provide an integrated signal, and generating an output signal when the integrated signal reaches a predetermined value.

4,224,652

METHOD AND APPARATUS FOR DETECTING GROUND SHORTS IN THE ROTOR CIRCUIT OF A GENERATOR

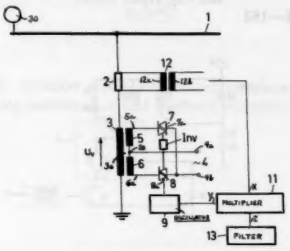
Michael Fiorentzis, Wettingen, Switzerland, assignor to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Feb. 6, 1978, Ser. No. 875,691

Claims priority, application Switzerland, Mar. 1, 1977, 2548/77

Int. Cl.² H02H *7/06, 3/16*

U.S. Cl. 361—42 **21 Claims**



1. A method of detecting ground shorts in generator rotor circuits of an electrical network, wherein for detecting essentially completely a ground short at the rotor circuit there are carried out the steps of:

modulating the phase of an alternating signal to produce an alternating injection signal;

delivering the alternating injection signal to the electrical network containing the rotor circuit at which there is to be detected any ground short; and

deriving from the electrical network a response signal corresponding to the alternating injection signal and indicative of the ground short at the rotor circuit.

4,224,653

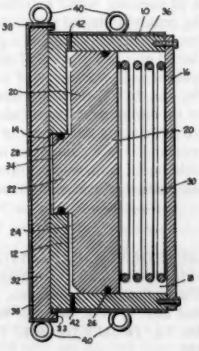
RELEASABLE MAGNETIC ATTACHMENT FOR UNDERWATER DIVER'S HOSE AND THE LIKE

Ronald A. Daspit, 2013 Todd Dr., Poydras, La. 70085

Continuation of Ser. No. 802,138, May 31, 1977, abandoned. This application Jan. 2, 1979, Ser. No. 519

Int. Cl.² H02H *5/10*

U.S. Cl. 361—144 **3 Claims**



1. A releasable magnetic attachment for underwater diver's hose and the like comprising a hermetically sealed casing, a separable magnetic plate attached to the casing by its magnetic attraction, a nonmagnetic movable piston sealed within the casing, a portion of the piston being projectable from the

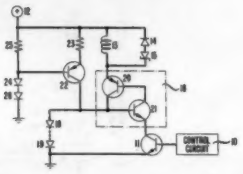
casing and in normally nonactuating relation to the magnetic plate, at least a portion of the casing facing the magnetic plate being of magnetically attractable material, and means for moving the piston to disengage the magnetic plate from the casing.

4,224,654

RELAY DRIVER CIRCUIT

David C. Goldthorp, Reading, Pa., and Frank P. Tuhy, Jr., Montville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1978, Ser. No. 974,390
Int. Cl.[3] H01F *27/42*
U.S. Cl. 361—152 **2 Claims**



1. A relay driver circuit including a transistor switch CHARACTERIZED BY

a semiconductor isolation device connected between the relay coil and said transistor switch,

means for enabling said isolation device in synchronism with said transistor switch, said enabling means comprising a constant current source and means responsive to said constant current source for enabling said isolation device whenever said transistor switch is enabled, and

a load connected to said constant current source,

said load providing a larger impedance to said constant current than the combination of said isolation device and said switching transistor.

4,224,655

ANTI-ELECTROSTATIC PROCEDURE FOR OPENING PETROLEUM EQUIPMENT

Redo G. Loncaric, Dallas, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 859,773, Dec. 12, 1977, abandoned. This application Mar. 1, 1979, Ser. No. 16,642
Int. Cl.[3] H05F *3/00*
U.S. Cl. 361—215 **16 Claims**

1. A method of opening liquid petroleum handling equipment comprising removing liquid petroleum from the portion of said equipment to be opened; flowing a continuous stream of nonflammable liquid into said portion of said equipment to wet the inside surface of said portion, said nonflammable liquid characterized by the fact that said nonflammable liquid increases the rate of discharge of static electricity inside said equipment, thereby reducing the danger of electrostatic sparking when said portion of said equipment is opened, removing said nonflammable liquid from said portion of said equipment, and opening said portion of said equipment.

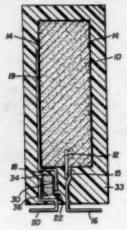
4,224,656

FUSED ELECTROLYTIC CAPACITOR ASSEMBLY

Henrique V. DeMatos, and John Piper, both of Greenville, S.C., assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 4, 1978, Ser. No. 966,392
Int. Cl.[2] H01G *9/00*; B01J *17/00*
U.S. Cl. 361—433 **4 Claims**

1. A fused capacitor assembly comprising a solid electrolytic capacitor body having two terminals, a fuse made of two exothermically alloyable metals in intimate contact with each other, a heat insulative body having a cavity therein substantially larger than said fuse for receiving said fuse, means for positioning said fuse in said cavity such that said fuse is thermally isolated from said heat insulative body and for providing a substantially airtight seal for said cavity, a first lead electrically connected from one said capacitor body terminal to said



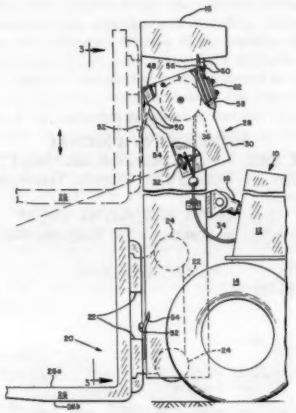
fuse, a second lead connected to said fuse such that said second lead, fuse and first lead are electrically in series with said capacitor body, a third lead connected to said other capacitor body terminal.

4,224,657

LIGHT ASSEMBLY FOR POSITIONING LIFT TRUCK LOAD-HANDLING DEVICE

John E. Olson, Portland, Oreg., assignor to Cascade Corporation, Portland, Oreg.

Filed Feb. 8, 1979, Ser. No. 10,303
Int. Cl.[3] B60Q *1/00*
U.S. Cl. 362—67 **18 Claims**



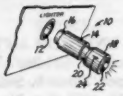
1. In a lift truck having a vertically-extending load-lifting mast for raising and lowering a load vertically, and a vertically-movable load-handling device mounted upon said mast having a load-engaging member thereon extending generally forwardly from said mast toward a forward end of said member, a positioning light assembly for said load-engaging member comprising light source means detachably mounted supportably upon said load-handling device so as to move vertically in unison therewith for projecting light in a generally forward direction, and first mutually cooperative means on said light source means and said mast for detaching said light source means from said load-handling device and attaching said light source means supportably to said mast in response to downward movement of said load-handling device below a predetermined elevation.

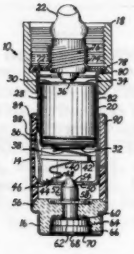
4,224,658

RECHARGEABLE FLASHLIGHT WITH INTEGRAL VARIABLE RATE BATTERY CHARGER FOR AUTOMOTIVE USE

Hemming G. Silberg, New Providence, N.J., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Aug. 10, 1978, Ser. No. 932,644
Int. Cl.² F21L 7/00; B60Q 3/04; H02J 7/00
U.S. Cl. 362—183 **6 Claims**





1. A rechargeable flashlight comprising:
(a) a case;
(b) a lamp in said case;
(c) a rechargeable battery in said case;
(d) means in said case for electrically connecting said rechargeable battery to said lamp whereby said lamp is illuminated;
(e) charging means in said case;
(f) said charging means comprising a charging network including a negative-temperature-coefficient thermistor and a positive-temperature-coefficient thermistor in series, said thermistors being selected to limit the charging current in said charging network to below a predetermined maximum value which varies with ambient temperature between relatively low values at low and high temperatures and a relatively high value at medium temperatures;
(g) means for electrically connecting said charging means to a source of electrical potential; and
(h) means for electrically connecting said rechargeable battery into said charging network.

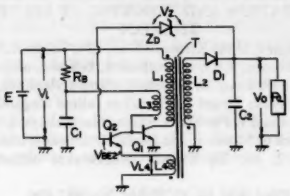
4,224,659

STABILIZED POWER SUPPLY CIRCUIT

Yasuhide Iguchi, Tsurugashima, Japan, assignor to Toko, Inc., Tokyo, Japan

Filed Apr. 14, 1978, Ser. No. 896,245
Claims priority, application Japan, Apr. 14, 1977, 52/42989
Int. Cl.² H02M 3/335
U.S. Cl. 363—20 **11 Claims**

1. A stabilized power supply circuit including a feedback circuit and output terminals, wherein there alternately occurs a time during which a current is caused to flow in a transformer so that energy is stored therein and a time during which the energy stored in the transformer is discharged, the improvement comprising a compensation winding which is connected in series with said feedback circuit so that a voltage proportional to an input voltage is produced whereby an output voltage variation across said output terminals caused by the operating resistance of said feedback circuit is cancelled.

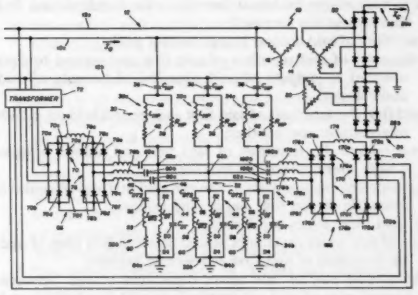


4,224,660

COMPOSITE FILTER FOR SUPPRESSING HARMONIC FREQUENCIES ON ELECTRIC POWER TRANSMISSION LINES

Narendra Mohan, Minneapolis, Minn., assignor to The Regents of the University of Minnesota, Minneapolis, Minn.

Filed Jan. 22, 1979, Ser. No. 5,318
Int. Cl.² H02M 1/12
U.S. Cl. 363—48 **8 Claims**



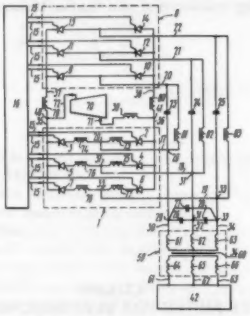
1. A composite filter for suppressing harmonics produced by a converter in an AC to DC power line transmission system comprising first and second filter sections, said first section passing current having a given harmonic frequency and also passing current having harmonic frequencies thereabove which are multiples of the system frequency, means connecting said first and second sections in series between one line of the AC portion of said power system and a second line thereof, said serially connected first and second filter sections together being substantially series-resonant at said given harmonic frequency, and means connected to the junction of said first and second filter sections for injecting current into said filter sections at said junction which injected current is sufficient to cause substantially complete filtration at said given harmonic frequency.

4,224,661

EXTERNALLY COMMUTATED COMPENSATION-TYPE CONVERTER SYSTEM AND METHOD OF FORCED COMMUTATION AND BLOCKING OF RECTIFIERS THEREOF

Jury M. Chuguev, ulitsa Kirova, 25, kv. 234; Taisia A. Matkova, ulitsa Matrosova, 5, kv. 4; Svetlana A. Ivanova, ulitsa Nikolaeva, 14, kv. 49; Geny K. Solodkov, ulitsa Rylenkova, 3, kv. 4, all of Smolensk; Sergei I. Pischikov, ulitsa Angarskaya, 61, kv. 20; Vsevolod I. Pischikov, ulitsa Ussuriiskaya 1, korpus 4, kv. 139, both of Moscow, and Boris M. Antonov, ulitsa Mayakovskogo, 2, kv. 22, Khimki Moskovskoi oblasti, all of U.S.S.R.

Filed Sep. 13, 1978, Ser. No. 942,496
Int. Cl.[2] H02M 7/515
U.S. Cl. 363—71 41 Claims



1. An externally commutated compensation-type converter system comprising:

a control unit having a plurality of outputs;

a first bridge having at least three a-c terminals and first and second d-c terminals;

rectifiers of said first bridge having gates;

a second bridge having at least three a-c terminals and first and second d-c terminals;

rectifiers of said second bridge having gates;

said gates of said rectifiers of said first and second bridges coupled to outputs of said plurality of outputs of said control unit;

said first d-c terminals of said first and second bridges which interconnect one another;

said second d-c terminals of said first and second bridges which interconnect one another;

a smoothing reactor placed between said first and second d-c terminals of said first and second bridges;

at least three series capacitors;

one of said series capacitors placed between first ones of said a-c terminals of said first and second bridges;

the second one of said series capacitors placed between second ones of said a-c terminals of said first and second bridges;

the third one of said series capacitors placed between third ones of said a-c terminals of said first and second bridges;

at least three shunt capacitors;

one of said shunt capacitors coupled in parallel with first and second ones of said a-c terminals of said first bridge;

the second one of said shunt capacitors coupled in parallel with first and third ones of said a-c terminals of said first bridge;

the third one of said shunt capacitors coupled in parallel with second and third ones of said a-c terminals of said first bridge;

a first common a-c terminal formed by connecting the first terminal of said first series capacitor, said first a-c terminal of said first bridge and first terminals of said first and second shunt capacitors;

a second common a-c terminal formed by connecting the first terminal of said second series capacitor, said second a-c terminal of said first bridge, the second terminal of said first shunt capacitor and the first terminal of said third shunt capacitor;

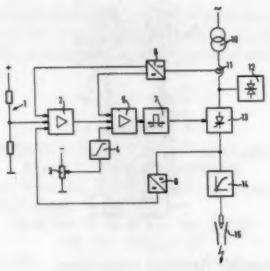
a third common a-c terminal formed by connecting the first terminal of said third series capacitor, said third a-c terminal of said first bridge and the second terminals of said second and third shunt capacitors.

4,224,662

POWER SUPPLY UNIT FOR A PLASMA PLANT

Paul Böniger, Huebstrasse 18, CH-8437 Zurzach, Switzerland, assignor to Paul Boniger, Zurzach, Switzerland

Filed Apr. 10, 1978, Ser. No. 894,619
Int. Cl.[2] H02M 7/155
U.S. Cl. 363—87 1 Claim



1. A power supply unit for a plasma plant, in particular for a plasma spraying plant, comprising an isolating transformer for connection to the main supply, a current controller and a thyristor assembly, the thyristor assembly being connected through a current control loop with a circuit supplied on the one hand with a reference voltage and on the other hand with the voltage existing at the plasma burner, and a potentiometer for adjusting the arc current, characterized in that

(a) said circuit is formed as voltage regulator (2) permitting setting of a desired voltage for no-load operation,

(b) the voltage regulator (2) is adapted to receive the plasma current by means of a current transformer (11),

(c) the output of the voltage regulator is connected with the input of the current controller (5),

(d) the current controller (5) is adapted to have its desired current value applied by means of said potentiometer (3) and additionally by means of a follow-up integrator (4) disposed in series to the tap of the potentiometer (3),

(e) the input of the current controller (5) is adapted to receive the plasma current by means of the current transformer, and

(f) the output of the current controller is connected to a control unit for the thyristor assembly (13).

4,224,663

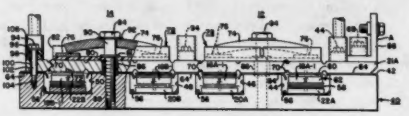
MOUNTING ASSEMBLY FOR SEMICONDUCTIVE CONTROLLED RECTIFIERS

John J. Maiese, Pittsburgh, and Kenneth E. Opal, Oakmont, both of Pa., assignors to Power Control Corporation, Pittsburgh, Pa.

Filed Feb. 1, 1979, Ser. No. 8,354
Int. Cl.[3] H01L 23/40
U.S. Cl. 363—144 13 Claims

1. A mounting assembly for a press-pack semiconductive controlled rectifier comprising base block means formed from material of high heat conductivity, a depressed portion formed in a surface of said base block means, a first electrical bus bar at the bottom of said depressed portion, a press-pack semicon-

ductive controlled rectifier positioned on said first bus bar with one terminal in electrical contact with said first bus bar, a second bus bar extending across said surface of the base block and in electrical contact with the other terminal of the semi-



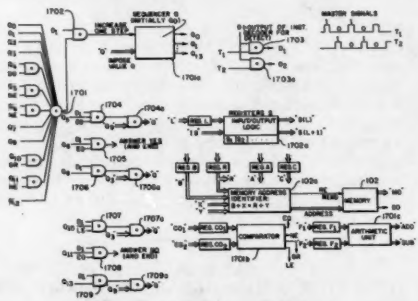
conductive controlled rectifier, and insulating material between said bus bars and said base block means, said insulating material permitting heat to flow from both bus bars into the base block means which acts as a common heat sink to dissipate heat from both bus bars.

4,224,664

APPARATUS FOR DETECTING WHEN THE ACTIVITY OF ONE PROCESS IN RELATION TO A COMMON PIECE OF INFORMATION INTERFERES WITH ANY OTHER PROCESS IN A MULTIPROGRAMMING/MULTIPROCESSING COMPUTER SYSTEM

Mario G. Trinchieri, Weston, Mass., assignor to Honeywell Information Systems Inc., Waltham, Mass.

Filed May 7, 1976, Ser. No. 684,345
Int. Cl.[3] G06F 9/46
U.S. Cl. 364—200 10 Claims



1. In a multiprogramming/multiprocessing computer system for executing a plurality of processes sharing common information in the form of records, pages or messages, apparatus for operating said system to avoid interferences between processes seeking access to said common information comprising:

first memory means storing utilization data identifying processes which have accessed said information;

second memory means storing precedence data representing the relative order in which said processes identified in said utilization data must access said information in accordance with a predetermined set of access rules;

identification means coupled to said first memory means for sensing said stored utilization data in response to a request made by a first process to access said information, said identification means responding to said utilization data to generate a precedence indication identifying any second process which has precedence over said first process to said information in accordance with said access rules; and

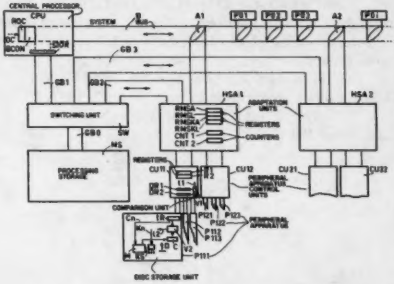
search means coupled to said second memory means and to said identification means for sensing said stored precedence data and for rejecting said access request made by said first process if said precedence data indicates that said first process has precedence to said information over any process identified by said precedence indication, whereby the possibility of an interference occurring between two processes relative to said information is prevented.

4,224,665

BUS-ORGANIZED COMPUTER SYSTEM WITH INDEPENDENT EXECUTION CONTROL

Adrianus M. J. de Bijl, and Hans Cramwinckel, both of Beekbergen, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 608,161, Aug. 27, 1975, abandoned.
This application Feb. 22, 1977, Ser. No. 770,808
Claims priority, application Netherlands, Sep. 10, 1974, 7411989
Int. Cl.[2] G06F 3/04, 9/06
U.S. Cl. 364—200 16 Claims



1. A bus organized computer system, said system including a central processing unit, a central data storage unit interconnected with said central processing unit and a plurality of peripheral devices, said peripheral devices being of at least one type and said peripheral devices being interconnected with said central processing unit, said system comprising:

a bus structure interconnecting said central processing unit with said central storage unit and said peripheral devices;

a bus control unit within said central processing unit for controlling data traffic on said bus structure;

said central storage unit being interconnected with said bus structure through said central processing unit;

a plurality of peripheral apparatus control units;

a plurality of peripheral devices interconnected with each of said peripheral apparatus control units;

means within said central processing unit to divide single program instructions for complete input/output operations serving for the transfer of data within said computer system to or from said peripheral devices into a plurality of separate instructions for discrete operations, the steps of said instructions constituting steps which relate to specific functional characteristics of at least one member of said plurality of peripheral devices;

means to transfer said instructions over said bus structure to said peripheral devices via said peripheral apparatus control units connected thereto such that said instructions can be individually executed in a particular addressed device of said plurality of peripheral devices in its own time in a specific sequence but time independently of other operation instructions within that sequence, to provide for the complete input/output operation;

means within each of said peripheral apparatus control units to acknowledge receipt of a separate discrete operation instruction to said central processing unit such that said central processing unit can transfer the next sequential separate operation instruction to the peripheral apparatus control unit controlling a particular addressed device of said plurality of peripheral devices;

means to transfer said separate instructions to that peripheral

apparatus control unit controlling the peripheral device addressed in said instructions over said bus structure individually, further including means to transfer the next separate instruction divided from a given single program instruction over said bus structure only in response to the receipt by said central processing unit of an interruption request signal from said peripheral apparatus control unit; and

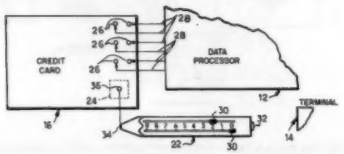
means within said central processing unit to record and store the execution of each of said separate discrete operation instructions executed through said peripheral apparatus control units such that said central processing unit can transfer the next sequential separate instruction and knows the status of execution of each instruction.

4,224,666

DATA PROCESSING SYSTEM WHICH PROTECTS THE SECRECY OF CONFIDENTIAL DATA

Georges J. L. Giraud, Le Vesinet, France, assignor to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull, Paris, France

Filed Apr. 27, 1978, Ser. No. 900,503
Claims priority, application France, Apr. 27, 1977, 77 12781
Int. Cl.[2] G06F *3/00*
U.S. Cl. 364—200 **18 Claims**



1. A data processing system comprising a data processing machine having means for transmitting data, said data being of the type which includes confidential data, and at least a first member means auxiliary to the machine for receiving and processing at least the said confidential data, said transmitting means including a plurality of second auxiliary member means separate from the machine, each said second auxiliary member means being a light pen having means for formulating the confidential data and including means for transmitting the said confidential data to the said first member by means of a data-carrying light wave which is guided between the first and second auxiliary members in a guidance zone outside which it cannot be detected.

4,224,667

COMMAND QUEUING FOR I/O ADAPTERS

David O. Lewis, Rochester; John W. Reed, Pine Island, and Gary W. Wallin, Mantorville, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 23, 1978, Ser. No. 954,070
Int. Cl.[3] G06F *3/00*
U.S. Cl. 364—200 **6 Claims**

1. In apparatus for transferring input-output (I/O) commands, including device address data and command data, to I/O adapters connected to I/O devices in a computer system having an addressable storage for storing instructions, data and I/O commands, a central processing unit (CPU) operable to fetch instructions from storage and execute said instructions, and channel means for managing and transferring I/O commands connecting the I/O adapters to the storage and the CPU, the improvement comprising:

an I/O command register;

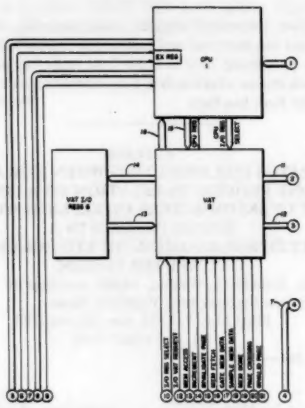
an I/O start device register;

means connected to the CPU for loading the I/O command register and the I/O start device register with an address of an I/O command;

control means in the channel means for accessing the storage at a location specified by the address in the I/O start device register and for transferring device address data accessed from the storage to the I/O adapters, said control means providing the I/O adapters with a first tag signal;

means in the I/O adapters responsive to the first tag signal for examining the device address data transferred from the control means and determining if the device address data is to be accepted;

means in the I/O adapters for transmitting a first acceptance signal to the control means upon determining that the device address data is to be accepted;



means in the I/O adapters for determining if command data is to be accepted and for transmitting a termination signal to the control means upon determining the command data is not to be accepted, said control means being responsive to the termination signal to terminate the first tag signal and leave the I/O command pending; and

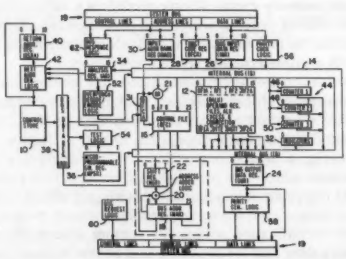
means in the I/O adapters for storing an indication that the termination signal was transmitted to indicate to an I/O adapter sending the termination signal that an I/O command is pending.

4,224,668

CONTROL STORE ADDRESS GENERATION LOGIC FOR A DATA PROCESSING SYSTEM

Arthur Peters, Sudbury, and Virendra S. Negi, Pepperell, both of Mass., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 3, 1979, Ser. No. 864
Int. Cl.[2] G06F *9/20*
U.S. Cl. 364—200 **10 Claims**



1. A data processor comprising:

A. a control store having a plurality of locations, each said

location for storing a control word, having a plurality of portions, for use in controlling the operation of said processor;

B. first means for receiving a plurality of signals indicative of status information of said data processor;

C. second means for receiving an instruction indicative of address information for use in addressing said control store;

D. third means for receiving a first selected portion of an addressed one of said control words;

E. first multiplexer means having an output for coupling to said output either said signals indicative of said status information or said selected portion of said addressed one of said control words;

F. means for decoding said information received by said second means for receiving;

G. means for selecting either said signals or said selected portion at said output of said first multiplexer means or for selecting said information received by said second means for receiving as decoded by said means for decoding;

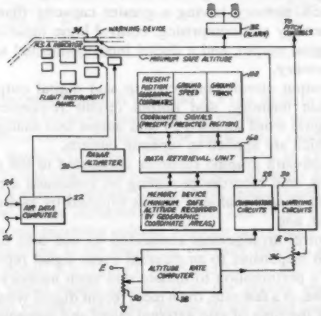
H. second multiplexer means having an output and a plurality of inputs, a first one of said inputs coupled to said means for selecting and a second one of said inputs coupled to receive a second portion of an addressed one of said control words from said control store; and

I. means, coupled to said output of said second multiplexer means, for addressing said control store by means of one of said inputs received by said second multiplexer means.

4,224,669
MINIMUM SAFE ALTITUDE MONITORING, INDICATION AND WARNING SYSTEM

Frank H. Brame, Redmond, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 22, 1977, Ser. No. 863,077
Int. Cl.[2] G01C 5/00; G08G 5/04
U.S. Cl. 364—433 **14 Claims**



1. A minimum safe altitude monitoring system for vehicles navigating over known terrain, and system comprising in combination with navigation computer means operable ongoingly to determine the present position of the vehicle and to provide position coordinate signals related to present position,

data storage means having recorded therein minimum safe altitude value data for each of respective predetermined sectional areas of a geographic territory over which the vehicle may navigate,

data retrieval means utilizing said coordinate signals ongoingly to selectively retrieve from said data storage means minimum safe altitude values to produce an output therefrom related to present position minimum safe altitude

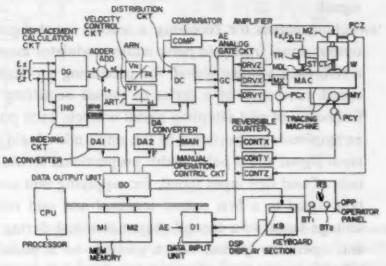
responsive means connected to receive said output supplied by said data retrieval means,

and means controlling initiation of operation of said responsive means in response to a predetermined difference between present altitude of the vehicle and said output minimum safe altitude value.

4,224,670
TRACER CONTROL SYSTEM

Etuo Yamazaki, Hachioji, Japan, assignor to Fujitsu Fanuc Limited, Hino, Japan

Filed Oct. 20, 1978, Ser. No. 953,210
Claims priority, application Japan, Mar. 23, 1978, 53-33398
Int. Cl.[3] G06F 15/46; G05B 19/42
U.S. Cl. 364—474 **7 Claims**

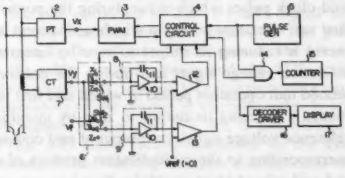


1. A tracer control system, for a tracer head which traces the surface of a model and outputs data signals representative of the model traced, in which the tracing direction and feedrate of the tracer head are calculated from said data signals derived from said tracer head, and in which said tracing direction and said feedrate are used to achieve tracing controls; the tracer control system comprising an input device for externally inputting input data defining a desired tracing operation, a memory means, operatively connected to said input device, for storing said input data, and a processor means, operatively connected to said memory means and said tracer head for reading said input data defining a desired tracing operation and for controlling a tracing path wherein the data stored in said memory means includes desired feed rate data and desired position data for defining the desired tracing operation, wherein the data stored in said memory means is modified by rewriting the content of said memory means, and wherein the content of said memory means may be modified during the tracing operation.

4,224,671
ARITHMETIC OPERATION APPARATUS FOR AN ELECTRONIC WATT-HOUR METER

Fumio Sugiyama, Sagamihara, and Isao Tashiro, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 31, 1978, Ser. No. 929,504
Claims priority, application Japan, Jul. 30, 1977, 52-91612; Mar. 22, 1978, 53-32750
Int. Cl.[2] G01R 11/32; G06G 7/16
U.S. Cl. 364—483 **5 Claims**



1. An arithmetic operation apparatus for an electronic watt-hour meter which comprises:

clock means for generating clock pulses having a reference frequency;

first frequency divider means coupled to said clock means for dividing the frequency of said clock pulses and for producing a sampling signal which defines a sampling period;

pulse width modulator means for receiving a first input signal and said sampling signal and for producing an output signal composed of a series of pulses occurring at the frequency of said sampling signal wherein each pulse has a width proportional to the amplitude of said first input signal;

switching means for receiving a second input signal, said output signal from said pulse width modulator means, and a reference voltage signal, for producing a combination signal composed of a series of pulses occurring at the frequency of said sampling signal wherein each pulse has an amplitude proportional to the amplitude of said second input signal and a pulse width proportional to the amplitude of said first input signal, for supplying said combination signal to a first output terminal and said reference voltage signal to a second output terminal during a first unit operation period which consists of a plurality of sampling periods, and for supplying said combination signal to said second output terminal and said reference voltage signal to said first output terminal during a second unit operation period which consists of a plurality of sampling periods, said first and said second unit operation periods recurring alternately;

first integrator means coupled to said first output terminal of said switching means for receiving and integrating said combination signal during said first unit operation period and for receiving and integrating said reference voltage signal during said second unit operation period, said reference voltage signal having a polarity opposite to that of the integrated output of said first integrator means appearing during said first unit operation period, said first integrator means acting as a reverse integrator during said second unit operation period by integrating said reference voltage signal until the output of said first integrator means is reduced to zero;

second integrator means coupled to said second output terminal of said switching means for receiving and integrating said combination signal during said second unit operation period and for receiving and integrating said reference voltage signal during said first unit operation period, said second integrator means acting as a reverse integrator during said first unit operation period by integrating said reference voltage signal until the output of said second integrator means is reduced to zero;

counter means coupled to said clock generator means and to said first and said second integrator means for counting said clock pulses which occur during the portion of said first unit operation period in which said second integrator means is reducing its output to zero by integrating said reference voltage signal and during the portion of said second unit operation period in which said first integrator means is reducing its output to zero by integrating said reference voltage signal, the output of said counter means corresponding to the multiplication product of said first and said second input signals; and

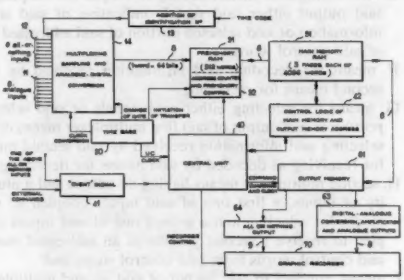
display means for displaying the output of said counter means.

4,224,672

PERTURBATION SIGNAL RECORDER

Rene O. Leleu, Versailles, and Pierre J. B. Cormault, Fourqueux, both of France, assignors to Electricite de France and Chiarelli Etudes et Realisations Mecaniques et Electroniques, both of, France

Filed May 29, 1979, Ser. No. 43,483
Claims priority, application France, Apr. 17, 1979, 79 09614
Int. Cl.[2] G01D *9/00, 4/10*
U.S. Cl. 346—33 R **9 Claims**



1. Perturbation signal recorder, characterised by the fact that it comprises, in combination:

a time base providing at least fast fate signals and slow rate signals,

an input circuit, receiving a series of signals to be monitored and said fast rate signals, said input circuit cyclically scanning said signals to be monitored according to a cycle defined by said fast rate signals and converting said signals to be monitored into a digital word for each scanning cycle,

a pre-memory receiving said digital word and said fast rate signals and storing the n most recent digital words,

a main memory having a greater capacity than said pre-memory and comprising: control logic inputs/outputs, a digital output, and a digital input connected to said pre-memory,

an output circuit connected to said digital output of said main memory, said output circuit re-converting each digital word supplied by said output into analogue signals which are applied to separate outputs,

a multi-path graphic recorder connected to the output circuit, said recorder providing on command a representation of said analogue signals supplied by said output circuit, and

a control arrangement connected to said time base circuit and responsive to an external event signal representative of a perturbation to initiate said main memory circuit to store, at a fast rate, the n most recent digital words preceding the time of said external event and subsequent digital words which appeared during and after said external event, and to cause said main memory circuit to supply stored digital words, at a slow rate and in chronological order, whilst initiating said graphic recorder.

4,224,673

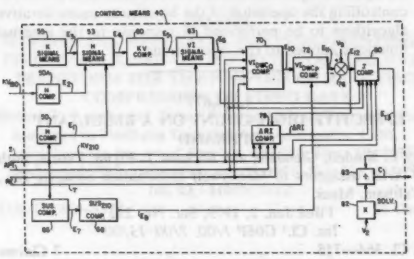
CONTROL SYSTEM FOR AN MP REFINING UNIT RECEIVING HEAVY SOUR CHARGE OIL

Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 953,064
Int. Cl.[2] G06G *7/58;* **C10G** *21/00*
U.S. Cl. 364—501 **7 Claims**

1. A control system for a refining unit receiving heavy sour charge oil and N-methyl-2-pyrrolidone solvent, one of which is maintained at a fixed flow rate while the flow rate of the

other is controlled by the control system, wherein said refining unit treats the received heavy sour charge oil with the received N-methyl-2-pyrrolidone to yield extract mix and raffinate, comprising gravity analyzer means for sampling the heavy sour charge oil and providing a signal API corresponding to the API gravity of the heavy sour charge oil, refractometer means for sampling the heavy sour charge oil and providing a signal RI corresponding to the refractive index of the heavy sour charge oil, viscosity analyzer means for sampling the heavy sour charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° C. and 210° F., respectively, sulfur analyzer means for sampling the heavy sour charge oil and providing signal S corresponding to the sulfur content of the heavy sour charge oil, flow rate sensing means for sensing the flow rates of the heavy sour charge oil and of the N-methyl-2-pyrrolidone and providing signals CHG and SOLV, corresponding to the heavy sour charge oil flow rate and the N-methyl-2-pyrrolidone flow rate, temperature sensing means sensing the temperature of the extract mix and providing a corresponding signal T, and control means connected to all of the analyzer means, to the refractometer means and to the sensing means for controlling the other flow rate of the charge oil and the M-methyl-2-pyrrolidone flow rates in accordance with signals API, KV_{150}, KV_{210}, S, RI, CHG and SOLV; wherein said control means includes VI signal means connected to the viscosity analyzer means for providing a signal VI corresponding to the viscosity index of the heavy sour charge oil in accordance with the



kinematic viscosity signals KV_{150} and KV_{210}; SUS_{210} signal means connected to the viscosity analyzer means for providing a signal SUS_{210} corresponding to the heavy sour charge oil viscosity in Saybolt Universal Seconds corrected to 210° F.; ΔVI signal means connected to the viscosity analyzer means, to the gravity analyzer means, to the sulfur analyzer means, to the VI signal means, refractometer means and to the SUS_{210} signal means and receiving voltage VI_{RP} for providing a signal ΔVI corresponding to the change in viscosity index in accordance with signals KV_{210}, API, VI, S and SUS_{210} and voltage VI_{RP}, ΔRI signal means connected to the gravity analyzer means, to the viscosity analyzer means, to the sulfur analyzer means and to the ΔVI signal means for providing a signal ΔRI corresponding to a change in refractive index between the heavy sour charge oil and the raffinate in accordance with signals KV_{210}, S, API and ΔVI; signal means receiving direct current voltages corresponding to values of constants C_{33} through C_{44} and being connected to the ΔVI signal means, to the ΔRI signal means, to the temperature sensing means, to the sulfur analyzer means, to the gravity analyzer means and to the VI signal means, for providing a J signal corresponding to a dosage for heavy sour charge oil in accordance with the signals ΔVI, ΔRI, S, T, KV_{210} and VI, the received voltages and the following equation:

$$J=C_{33}-C_{34}(\Delta VI)+C_{35}(S)^2-C_{36}(VI)^2-C_{37}(S)(T)+C_{38}(KV_{210})(T)+C_{39}(KV_{210})+C_{40}(\Delta RI)(T)+C_{41}(\Delta RI)(\Delta VI),$$

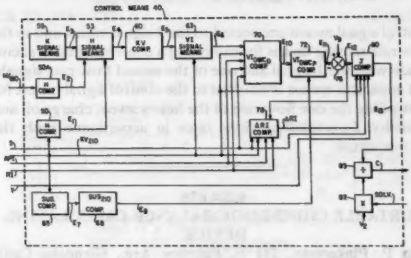
where C_{33} through C_{87} are constants.

4,224,674

CONTROL SYSTEM FOR AN N-METHYL-2-PYRROLIDONE REFINING UNIT RECEIVING HEAVY SWEET CHARGE OIL

Avilino Sequeira, Jr., and Frank L. Barger, both of Port Arthur, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 19, 1978, Ser. No. 953,069
Int. Cl.[2] G06G 7/58; C10G 21/00
U.S. Cl. 364—501 **7 Claims**



1. A control system for a refining unit receiving heavy sweet charge oil and N-methyl-2-pyrrolidone solvent, one of which is maintained at a fixed rate while the flow rate of the other is controlled by the control system, wherein said refining unit treats the received heavy sweet charge oil with the received N-methyl-2-pyrrolidone to yield extract mix and raffinate which is subsequently processed to yield refined oil, comprising gravity analyzer means for sampling the heavy sweet charge oil and providing a signal API corresponding to the API gravity of the heavy sweet charge oil; refractometer means for sampling the heavy sweet charge oil and providing a signal RI corresponding to the refractive index of the heavy sweet charge oil; viscosity analyzer means for sampling the heavy sweet charge oil and providing signals KV_{150} and KV_{210} corresponding to the kinematic viscosities, corrected to 150° F. and 210° F., respectively; sulfur analyzer means for sampling the heavy sweet charge oil and providing a signal S corresponding to the sulfur content of the heavy sweet charge oil; flow rate sensing means for sensing the flow rates of the heavy sweet charge oil and of the N-methyl-2-pyrrolidone and providing signals CHG and SOLV, corresponding to the charge oil flow rate and the N-methyl-2-pyrrolidone flow rate respectively; temperature sensing means sensing the temperature of the extract mix and providing a corresponding signal T; and control means connected to all of the analyzer means, to the refractometer means and to all the sensing means for controlling the other flow rate of the heavy sweet charge oil and the N-methyl-2-pyrrolidone flow rate in accordance with signals API, RI, KV_{150}, KV_{210}, S, T, CHG and SOLV, wherein said control means includes VI signal means connected to the viscosity analyzer means for providing a signal VI corresponding to the viscosity index of the heavy sweet charge oil in accordance with kinematic viscosity signals KV_{150} and KV_{210}, SUS_{210} signal means connected to the viscosity analyzer means for providing a signal SUS_{210} corresponding to the heavy sweet charge oil viscosity in Saybolt Universal Seconds corrected to 210° F., ΔVI signal means connected to the viscosity analyzer means, to the gravity analyzer means, to the refractometer means, to the VI signal means, to the sulfur analyzer means and the SUS_{210} signal means and receiving a DC voltage VI_{RP} for providing a signal ΔVI corresponding to the change in viscosity index in accordance with signals KV_{210}, API, VI, RI, S and SUS_{210} and voltage VI_{RP}, ΔRI signal means connected to the gravity analyzer means, to the viscosity analyzer means, to the sulfur analyzer means, and to the ΔVI signal means for providing a signal ΔRI corresponding to a change in refractive index between the heavy sweet charge oil and the raffinate, J signal means receiving direct current voltages corresponding to

constants C_{33} through C_{38} and being connected to the VI signal means, to the ΔRI signal means, to the temperature sensing means and to the sulfur analyzer means for providing a J signal corresponding to an N-methyl-2-pyrrolidone dosage J for heavy sweet charge oil in accordance with the signals ΔVI, ΔRI, S and T, the received voltages and the following equation:

$$J=-C_{33}+C_{34}(\Delta VI)+C_{35}(T)^2-C_{36}(S)+C_{37}(-\Delta RI)(\Delta VI)+C_{38}(\Delta VI)(T),$$

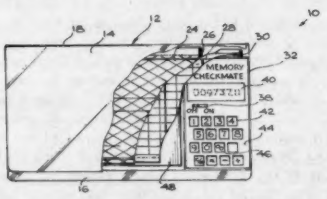
control signal means connected to the J signal means and to the flow rate sensing means for providing a control signal in accordance with the J signal and one of the sensed flow rate signals, and apparatus means connected to the control signal means for controlling the one flow rate of the heavy sweet charge oil and N-methyl-2-pyrrolidone flow rates in accordance with the control signal.

4,224,675

PORTABLE CHECKBOOK-BALANCE CALCULATING DEVICE

John P. Pinkerman, 211 E. Fairview Ave., Glendale, Calif. 91207

Filed Dec. 11, 1978, Ser. No. 968,308
Int. Cl.[2] G06F *15/02*
U.S. Cl. 364—705 **4 Claims**



1. An improved portable check recordal device comprising in combination:

a. a cover having on inside surface a first pocket on one side of said cover and a second pocket on opposite side of said cover where openings of said pockets face each other;

b. a block of checks having a backing on the front surface thereof and having a retaining tab with a width slightly less than half the width of said first pocket and where tab is disposed in said first pocket, and where block is movable between a first position within said cover to a second position lateral of a position of said cover;

c. a check recordal pad having a retaining tab with a width slightly less than half the width of said second pocket and where tab is disposed in said second pocket, and where pad is movable between a first position within said cover to a second position lateral of a position of said cover, and in a direction opposite to that of said block, and where said pad and said block are in a side-by-side non-overlapping relationship between each other;

d. a check calculator affixed to said backing of said block by affixing means whereby when block is moved said calculator is also moved.

4,224,676

ARITHMETIC LOGIC UNIT BIT-SLICE WITH INTERNAL DISTRIBUTED ITERATIVE CONTROL

Daren R. Appelt, Austin, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

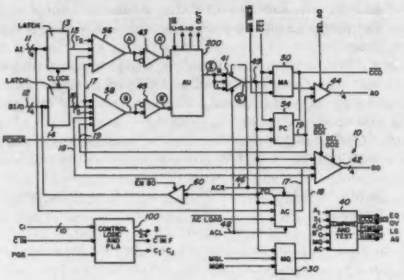
Filed Jun. 30, 1978, Ser. No. 920,754
Int. Cl.[3] G06F *7/48*
U.S. Cl. 364—712 **10 Claims**

1. An arithmetic logic unit bit-slice implemented in a semiconductor substrate and adapted to be concatenated with one or more identical bit-slices to form an arithmetic logic unit of any desired length, comprising:

(a) an arithmetic unit having an input and an output;

(b) operand input means for receiving at least two operands, connected to the arithmetic unit input;

(c) accumulator means having input means connected to the output of the arithmetic unit; and



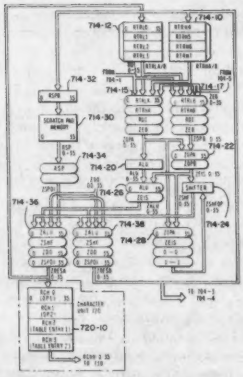
(d) control means having input means for receiving external functions including a clock and command inputs, and having output means connected to the arithmetic unit, to the operand input means and to the accumulator means for controlling the operation of the bit-slice to cause iterative algorithms to be performed in response to the external functions applied to the input means.

4,224,677

EFFECTIVE DIGIT COUNT ON A RESULTANT OPERAND

Jerry L. Kindell, Glendale, and Richard T. Flynn, Peoria, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Jan. 2, 1979, Ser. No. 222
Int. Cl.[3] G06F *1/00, 7/00, 13/00*
U.S. Cl. 364—715 **7 Claims**



1. A decimal unit for modifying decimal numeric resultant operands, that were processed by a microprogrammed execution unit, for storage in a memory, comprising:

means for receiving signals indicative of each work of said resultant operands sent from said execution unit, least significant word first, each word being received in response to a microword;

detecting means coupled to said receiving means and respon-

sive to said word signals for generating signals indicative of decimal digit positons of said least significant word and subsequent words of said resultant opernd;

decoding means coupled to said detecting means, and responsive to said decimal digit signals for generating a first signal in a first state indicative of a decimal digit in a first position of said word having a value greater than decimal zero, and generating binary signals indicative of the position of the most significant decimal digit of said word if said decimal digit in said first position has a value of decimal zero indicated by said first signal being in a second state;

word counter means responsive to a control signal for generating signals indicative of a count of one less than the number of words of said resultant operand received by said receiving means;

adder means coupled to said word counter means and to said decoding means and responsive to said count signals and to said first signal for generating signals indicative of the number of effective words received by said receiving means;

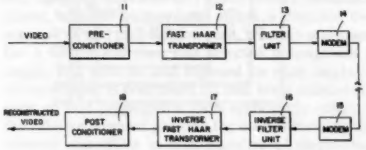
an effective digit count register having at least a first and a second portion, said first portion being operatively coupled to said adder means for storing signals indicative of the number of effective words, and said second portion being operatively coupled to said decoding means for storing said binary signals, said register storing the number of effective digits received by said unit on a cycle said word was transferred from said execution unit.

4,224,678

METHOD AND APPARATUS FOR IMPLEMENTING A PROCESSOR BASED ON THE RATIONALIZED HAAR TRANSFORM FOR THE PURPOSE OF REAL TIME COMPRESSION OF VIDEO DATA

Robert T. Lynch, and James J. Reis, both of Torrance, Calif., assignors to Northrop Corporation, Los Angeles, Calif.

Continuation-in-part of Ser. No. 559,246, Mar. 17, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,799
Int. Cl.[2] H04N 7/12
U.S. Cl. 364—724 **11 Claims**



1. A filter system for encoding transform coefficients representing video data to substantially reduce the number of bits therein comprising:

zonal filter means for receiving said transform coefficients and separating preselected coefficients for compression from coefficients not to be compressed,

threshold filter means coupled to the output of said zonal filter means for receiving the preselected coefficients for compression and deleting transform coefficients below a predetermined magnitude therefrom,

multiplier means coupled to the output of said threshold filter for eliminating a preselected number of least significant digits from said transform coefficients,

edge enhancer filter means coupled to the output of said multiplier means for multiplying various preselected higher order transform coefficients to provide edge enhancement thereof,

compander means coupled to the output of said edge enhancement filter means for providing further compression of said transform coefficients by various non-linear companding based on an integer log functional rule, and

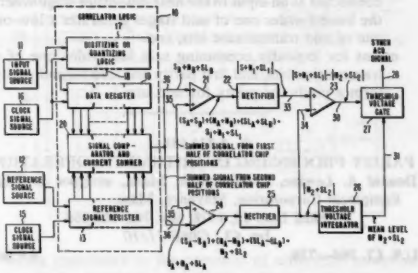
adaptive filter means coupled to the output of said compander for selecting the N largest magnitude coefficients to thereby provide filter digitized transformed video data.

4,224,679

SIGNAL CORRELATION MEANS

Edward J. Nossen, Cherry Hill, and Conrad H. Haber, Turnersville, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 16, 1978, Ser. No. 951,381
Int. Cl.[2] G06F 15/34; G06G 7/19
U.S. Cl. 364—728 **6 Claims**



1. Means for reducing side lobe signals and noise signals generated in a correlator having N chip (bit) positions for comparing a received coded input signal with a stored reference signal and comprising:

adding means for producing a total summed and rectified signal consisting of all the signals generated by said correlator in each chip position thereof;

first differencing means for producing a total differenced signal consisting of the rectified difference of the total summed signals generated in a first half of the N chip positions of said correlator from the total summed signals generated in the second half of N chip positions of said correlator; and

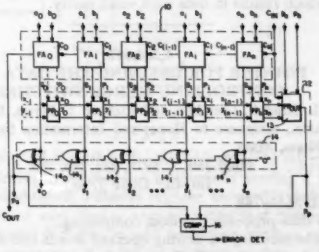
second differencing means for taking the difference between said total differenced signal and said total summed and rectified signal to produce enhanced output signals.

4,224,680

PARITY PREDICTION CIRCUIT FOR ADDER/COUNTER

Kenichi Miura, Saratoga, Calif., assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 5, 1978, Ser. No. 912,452
Int. Cl.[2] G06F 11/10
U.S. Cl. 364—738 **20 Claims**



1. An adder for adding a first number and a second number to form a sum, said first number defined by first bits organized

from high-order to low-order and having a first parity and said second number defined by second bits organized from high-order to low-order and having a second parity said adder including a parity prediction circuit comprising,

a parity prediction network formed of a plurality of stages, said stages organized from high-order to low-order so that each one of said stages corresponds in order to one of said first bits and to one of said second bits, where each stage includes means for generating one or more parity prediction transmission bits from a corresponding one of said first bits, from a corresponding one of said second bits and from the next higher-order one or more of said transmission bits, said stages serially connected with each one or more transmission bits generated by a high-order stage connected as an input to the next low-order stage whereby the lowest-order one of said stages generates a low-order one of said transmission bits, and

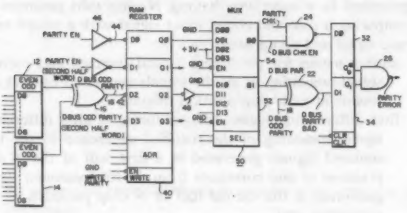
means for logically combining said low-order one of said transmission bits, and first parity and said second parity to form a predicted parity for said sum.

4,224,681

PARITY PROCESSING IN ARITHMETIC OPERATIONS

Donald A. Lewine, Marlborough, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Dec. 15, 1978, Ser. No. 969,955
Int. Cl.³ G06F *11/10*
U.S. Cl. 364—738 **4 Claims**



1. A parity checking apparatus for use in a data processing system to check the parity of data words of a plurality of bits each, the data processing system being controlled by instructions which determine operations to be executed, comprising:

means for generating a parity signal representing the parity of a data word;

means responsive to the executed instruction which produced the data word for determining whether such instruction results in data with valid parity, to generate a parity valid signal when the executed instruction produces data with valid parity; and

means responsive to the parity valid signal and the parity signal for generating a parity error signal in response to the generation of incorrect parity from an instruction which results in data with valid parity.

4,224,682

POINTER FOR DEFINING THE DATA BY CONTROLLING MERGE SWITCHES

Jerry L. Kindell, Glendale, and Richard T. Flynn, Peoria, both of Ariz., assignors to Honeywell Information Systems Inc., Waltham, Mass.

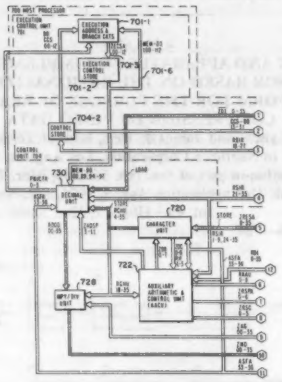
Filed Jan. 2, 1979, Ser. No. 391
Int. Cl.³ G06F *7/48*
U.S. Cl. 364—748 **18 Claims**

1. A data processing system comprising:

a cache memory for storing operand words and instructions, each of said operand words being coded to specify a number of types of information, said number of types of information including decimal digits, sign characters, exponent characters and non-operand information, each of said instructions including an operation code portion specifying a decimal numeric operation performed by said system and also including descriptor information for describing characteristics of said operand words;

an execution control unit for storing microwords, said data processing system being responsive to said microwords for executing operations specified by said operation code portion of said instructions;

a control unit coupled to said cache and to said execution control unit, said cache and said control unit being responsive to said microwords for transferring one of said instructions and said descriptor information specifying a decimal numeric operation to said control unit from said cache, said control unit being responsive to said microwords for transferring said operation code portion of said one of said instructions to said execution control unit, said execution control unit being responsive to said operation code portion of said instruction for selecting a series of said microwords, said data processing system being responsive to said series of said microwords for executing said decimal numeric operation;



a decimal unit coupled to said control unit and to said cache, said decimal unit storing said descriptor information received from said control unit and storing said operand words received from said cache, said descriptor information conditioning said decimal unit to select said decimal digits of said operand words when said operand words are transferred to said decimal unit from said cache;

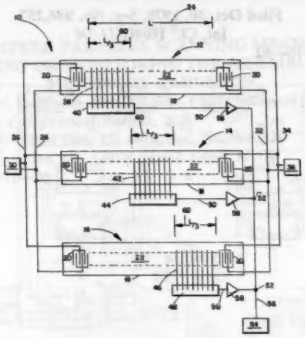
an execution unit coupled to said decimal unit for receiving said decimal digits in response to said series of microwords and performing said decimal numeric instruction thereby generating and transferring decimal digits specifying an arithmetic result to said decimal unit for forming resultant operand words for transfer to said cache;

wherein said decimal unit includes shifter means for generating register and switch control signals for selecting said decimal digits of said operand words received from said cache, and also forming said resultant operand words received from said execution unit on the cycle said operand words are processed by said decimal unit.

4,224,683
MULTIPLE-CHANNEL ACOUSTO-ELECTRIC CONVOLVER

Larry R. Adkins, Tustin, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 25, 1978, Ser. No. 937,630
Int. Cl.³ G06G 7/195;
U.S. Cl. 364—821 **8 Claims**



1. A multiple-channel acousto-electric convolver, comprising:

(a) a plurality of single-channel acousto-electric convolvers having their first input interdigital transducers connected in parallel and their second input interdigital transducers connected in parallel; each of said single-channel convolvers comprising:

(1) a body of piezoelectric material for inducing electric field variations along a propagation path thereon for counter-propagating surface acoustic waves, said propagation path having a selected length;

(2) space-charge-enhancement means for interacting with said electric field variations; and

(3) coupler means for sensing said electric field variations and coupling them into said space-charge-enhancement means, wherein said coupler means is disposed over a segment of said propagation path, wherein said segment has a length less than said selected propagation path length, and wherein said segment for each single-channel convolver is positioned on said body relative to the ends of said propagation path sufficiently offset from the relative segment position for each remaining single-channel convolver in said plurality of single-channel convolvers that electric field variations sensed by said coupling means on any one single-channel convolver differ significantly from those sensed on any other of said plurality of single-channel convolvers; and

(b) means for combining the effects of said electric field variations on said space-charge-enhancement means of said plurality of single-channel convolvers in a single output signal.

4,224,684
RECEIVE/BYPASS CIRCUIT FOR SUBSYSTEMS IN POLLING SYSTEM

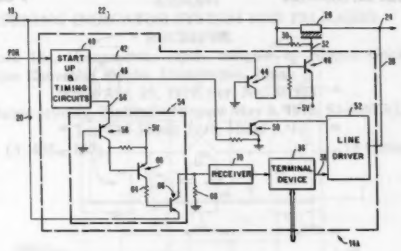
David E. Conner, Cary; Charles R. Hoffman, Raleigh, and Melvin T. Laakso, Cary, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 22, 1978, Ser. No. 944,960
Int. Cl.² H03K 17/60; H04Q 1/20
U.S. Cl. 364—900 **7 Claims**

1. For use in a polled system including a central processor having a polling signal line and a plurality of subsystems, each having a terminal device which may respond to a received polling signal by establishing a communications link with the central processor, a receive/bypass circuit connected to each of the terminal devices and capable of causing a polling signal to be routed to a powered terminal device or past an unpowered terminal device, each said receive/bypass circuit comprising:

a first depletion mode field effect transistor having a drain electrode connected to a polling signal input line, a source electrode connected to a polling signal output line, and a gate electrode; and

a control circuit connected to the polling signal input line, to the gate electrode of said first depletion mode field effect transistor and to the terminal device, said control circuit



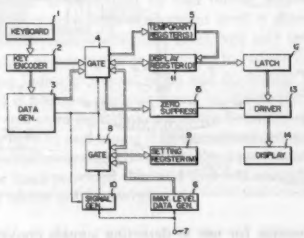
being responsive to the presence of subsystem power to establish a conduction-inhibiting voltage on the gate electrode of said first depletion mode field effect transistor while routing an input polling signal to the powered terminal device for retransmission by the terminal device to the polling signal output line if no communications link is to be established,

said first depletion mode field effect transistor being conductive in the absence of power at the subsystem to permit the polling signal to pass directly from the input line to the output line.

4,224,685
POWER LEVEL SETTING/DISPLAY CIRCUIT FOR A MICROWAVE OVEN

Masayuki Sasaki, Kawasaki; Yoshio Oida, Funabashi, and Hidetoshi Semi, Kamakura, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Jul. 28, 1978, Ser. No. 929,010
Claims priority, application Japan, Jul. 30, 1977, 52/91622
Int. Cl.² H05B 9/06
U.S. Cl. 364—900 **4 Claims**



1. A power level setting/display circuit for a microwave oven comprising a register for temporarily storing a power level command signal, a display register, means for clearing all the contents of said display register when said power level command signal is stored in said temporary storage register, means for generating a series of instruction data, a setting register, means for transferring the content of said temporary register to a predetermined location of the cleared display register in response to a said generated instruction data and for

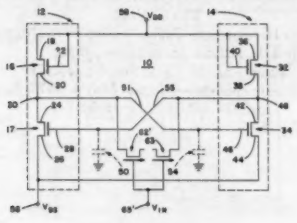
transferrinng the content of said display register to said setting register in response to another said generated instruction data.

4,224,686

ELECTRICALLY ALTERABLE MEMORY CELL

Nicholas E. Aneshansley, Centerville, Ohio, assignor to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 812,863, Jul. 5, 1977, abandoned, which is a continuation of Ser. No. 610,813, Sep. 5, 1975, abandoned.
This application Oct. 2, 1978, Ser. No. 947,927
Int. Cl.[2] G11C *11/40, 17/00*
U.S. Cl. 365—154 **9 Claims**



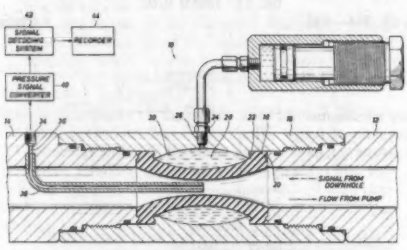
8. A non-volatile memory device comprising a bistable circuit having a pair of cross-coupled field effect transistors defining a pair of output terminals for storing volatile binary data in the form of respective pairs of voltage signals on said output terminals; and a pair of capacitance means each having one terminal coupled to one of said output terminals, at least one of said capacitance means comprising a non-volatile, threshold-alterable capacitor having a gate electrode independent of said output terminals and adapted to respond to a control signal to store said volatile binary data in terms of the threshold voltage value of said non-volatile capacitor.

4,224,687

PRESSURE PULSE DETECTION APPARATUS INCORPORATING NOISE REDUCTION FEATURE

Jack R. Claycomb, 8226 Waynemer, Houston, Tex. 77040

Filed Apr. 18, 1979, Ser. No. 31,078
Int. Cl.[2] E21B *47/06*
U.S. Cl. 367—83 **10 Claims**



10. Apparatus for use in detecting signals conveyed up a column of drilling mud in a drill string from a downhole signal source wherein the apparatus is subjected to noise from an upstream source such as a noisy mud pump, which apparatus is adapted to be connected in the mud flow path at a selected location and which apparatus comprises:

(a) a Pitot tube with an open end positioned in the mud flow path and pointed downstream; and

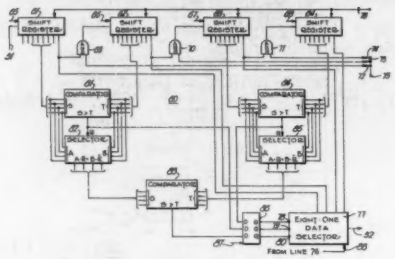
(b) an axially located venturi having a throat of reduced diameter compared with the end diameter and surrounding said Pitot tube wherein the diameter is reduced from the end diameter in relation to the mud flow velocity and pressure at said venturi.

4,224,688

DIGITAL CONFERENCE CIRCUIT

Carmine A. Ciancibello, and Ernst A. Munter, both of Ottawa, Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Oct. 30, 1978, Ser. No. 956,257
Int. Cl.[3] H04Q *11/04*
U.S. Cl. 370—62 **21 Claims**



1. A conference circuit for connection in a digital telephone system intermediate a first TDM (time division multiplex) bus for carrying, in N distinct time slots, PCM (pulse code modulation) words to said conference circuit, and a second TDM bus for carrying, in N distinct time slots, PCM words from said conference circuit, wherein N is a positive integer, $2 \leqq N \leqq 128$, said conference circuit comprising:

serial storage means for storing the $N-1$ most recent PCM words received from said first TDM bus during $N-1$ of said N time slots;

circuit means for determining, according to a predetermined criterion, which one of said PCM words stored in said storage means meets said criterion; and

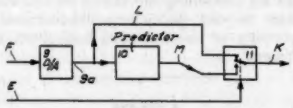
routing means for routing the PCM word meeting said criterion to said second TDM bus in the next one of said N time slots.

4,224,689

APPARATUS FOR SMOOTHING TRANSMISSION ERRORS

Carl-Erik W. Sundberg, Vildandsvägen 24C, 222 34 Lund, Sweden

Filed Oct. 3, 1978, Ser. No. 948,304
Claims priority, application Sweden, Oct. 11, 1977, 7711384
Int. Cl.[2] G08C *25/00*; G06F *11/00*
U.S. Cl. 371—6 **11 Claims**



1. Apparatus for smoothing transmission errors in a received signal to compensate for digital errors occurring in a transmitted signal to thereby produce a receiver output signal which resembles the signal transmitted by a transmitter with a higher degree of probability, comprising:

means for detecting the amplitude value of a received bit relative to a predetermined threshold value and for producing an output signal when the detected value is less than said threshold value;

means for detecting the data level of a received bit or group of bits;

means for estimating the probable data level of a received bit or group of bits based upon the inherent bit redundancy in a received information signal; and

switching means normally connecting said data level detecting means to an output terminal and responsive to the output signal from said threshold detecting means for disconnecting said data level detecting means and connecting said estimating means to the output terminal.

4,224,690

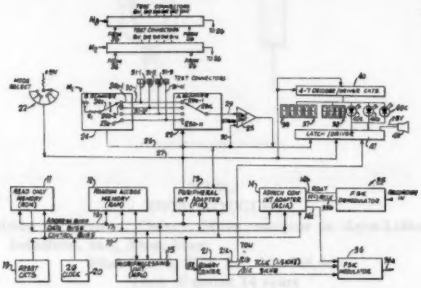
HIGH SPEED PARALLEL SCANNING MEANS FOR TESTING OR MONITORING THE ASSEMBLY OF MULTIWIRE HARNESSES

Kenneth N. Rockwell, Yorba Linda, Calif., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Dec. 12, 1978, Ser. No. 968,828

Int. Cl.[3] G01R *31/02;* G06F *11/00*

U.S. Cl. 371—25 **27 Claims**



1. Apparatus for testing a test multiconductor harness having a plurality of end points against a known good multiconductor harness having a plurality of end points, said apparatus comprising:

storage means for storing information representative of circuit conditions existing between said plurality of end points established by the conductors of said known good multiconductor harness;

testing means for connection separately to each such harness for simultaneously applying a signal to preselected groups of said plurality of end points of such connected harness;

detection means for connection to such connected harness and responsive to such signal for determining circuit conditions existing between such preselected groups of said plurality of end points of such connected harness;

transfer means connected to said detection means and said storage means for transferring information representative of said circuit conditions of the conductors of said known good multiconductor harness to said storage means;

comparing means connected to said detection means and said storage means for comparing circuit conditions existing between said plurality of end points established by the conductors of said known good harness with circuit conditions existing between the plurality of points established by the conductors of said test multiconductor harness;

signaling means connected to said comparing means for indicating the result of the operation performed by said comparing means; and

control means for selectively operating said testing means and said transfer means when the conductors of said known good harness are connected with said apparatus and for selectively operating said comparing means and said signaling means when the conductors of said test multiconductor harness are connected with said apparatus.

4,224,691

TUNING INDICATOR SYSTEM FOR FM RADIO RECEIVER

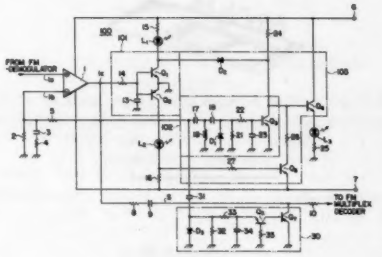
Masaru Ida, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Apr. 25, 1979, Ser. No. 33,171

Claims priority, application Japan, May 4, 1978, 53-60673[U]

Int. Cl.[2] H04B *1/16;* H03J *3/14*

U.S. Cl. 455—159 **13 Claims**



1. A tuning indicator system for an FM radio receiver, comprising:

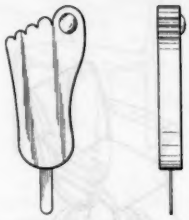
a first, a second and a third light-emitting means for visual indication of tuning conditions of said receiver; and

a tuning indicator circuit operative in association with an output of an FM demodulator included in said receiver for driving said first, second and third light-emitting means,

said tuning indicator circuit including circuit means for detecting the level of the dc-voltage component of said demodulator output and circuit means for detecting the level of detuning noise component of said demodulator output, whereby said first light-emitting means becomes energized to emit light by said tuning indicator circuit when said dc-voltage component level is above a predetermined positive reference level, and said second light-emitting means becomes energized to radiate light by said tuning indicator circuit when said dc-voltage component level is below a predetermined negative reference level, and said third light-emitting means becomes energized to emit light by said tuning indicator circuit when said detuning-noise component level is below a predetermined reference level provided that said first and second light-emitting means are de-energized.

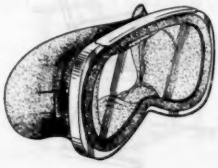
SEPTEMBER 23, 1980

256,960
FROZEN CONFECTION
D. S. Abernethy, Kansas City, Mo., assignor to Merritt Foods Co., Kansas City, Mo.
Filed Mar. 8, 1978, Ser. No. 884,719
Term of patent 14 years
Int. Cl. D01—*01*
U.S. Cl. D1—18

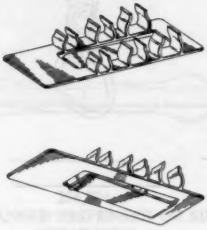


256,961
SWIM GOGGLES
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Dec. 4, 1978, Ser. No. 966,463
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234

256,962
DIVING MASK
Simon C. Fireman, Quincy, Mass., assignor to Aqua-Leisure Industries, Inc., Avon, Mass.
Filed Dec. 4, 1978, Ser. No. 966,465
Term of patent 14 years
Int. Cl. D2—*03*
U.S. Cl. D2—234



256,963
CLIP ON PEN AND PENCIL HOLDER
John C. Harrington, 450 Holly St., Canfield, Ohio 44506
Filed Nov. 13, 1978, Ser. No. 959,567
Term of patent 14 years
Int. Cl. D02—*99*
U.S. Cl. D2—400



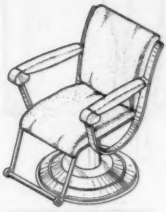
256,964
COMBINED KEY AND COIN HOLDER
Manuel Santana, 25208 Wheeler Rd., Newhall, Calif. 91321
Filed Nov. 24, 1978, Ser. No. 963,570
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—62

256,965
KEY RING
John Herman, 3060 Belden Dr., Los Angeles, Calif. 90068
Filed Nov. 6, 1978, Ser. No. 957,755
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—65

256,966
TRAVEL BAG
James W. Iszler, Apartado Aero 22905, Bogota, Colombia
Filed May 18, 1977, Ser. No. 797,975
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D3—71

256,967
CHAIR FOR USE IN BARBERS AND BEAUTY PARLORS
Yasuke Hirota, Yao, Japan, assignor to Oohiro Seisakusho Co., Ltd. (Oohiro Works Limited), Osaka, Japan
Filed Apr. 6, 1978, Ser. No. 894,615
Claims priority, application Japan, Jan. 26, 1978, 53-2397
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22

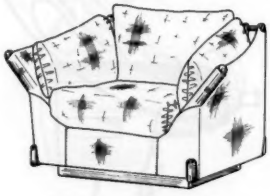
256,968
CHAIR FOR USE IN BARBERS AND BEAUTY PARLORS
Yasuke Hirota, Yao, Japan, assignor to Oohiro Seisakusho Co., Ltd. (Oohiro Works Limited), Osaka, Japan
Filed Apr. 6, 1978, Ser. No. 894,616
Claims priority, application Japan, Jan. 26, 1978, 53-2396
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—22



256,969
CHAIR
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 22, 1978, Ser. No. 889,125
Claims priority, application Italy, Sep. 23, 1977, 22329/77[U]
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

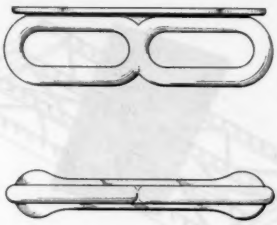
256,970
CHAIR
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 22, 1978, Ser. No. 889,126
Claims priority, application Italy, Sep. 23, 1977, 22330 B/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—66

256,971
ARM-CHAIR
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 22, 1978, Ser. No. 889,123
Claims priority, application Italy, Sep. 23, 1977, 22327 B/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—71

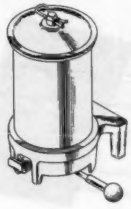


256,972
ARM-CHAIR
Franco Cassina, Meda, Italy, assignor to Cassina S.p.A., Meda, Italy
Filed Mar. 22, 1978, Ser. No. 889,127
Claims priority, application Italy, Sep. 23, 1977, 22332 B/77
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—73

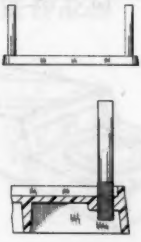
256,973
BATHTUB SAFETY HANDLE
Carl J. Dexter, 130 Hideaway La., West Lafayette, Ind. 47906
Filed Dec. 4, 1978, Ser. No. 966,108
Term of patent 14 years
Int. Cl. D23—*02*; D8—*06*
U.S. Cl. D6—86



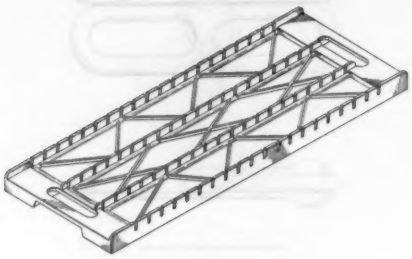
256,974
HAND CLEANSER DISPENSER OR SIMILAR APPARATUS
Samuel A. Redman, Dallas, Tex., assignor to Texas Novachem Corporation, Dallas, Tex.
Filed Jun. 8, 1978, Ser. No. 913,755
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D6—95



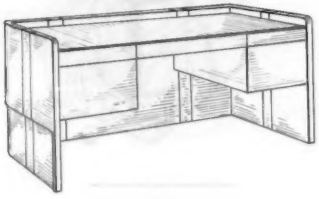
256,975
PLATFORM SUPPORT
Daniel L. Cummings, 2206 Garfield Ave. South, Minneapolis, Minn. 55405
Filed May 10, 1978, Ser. No. 904,639
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—113



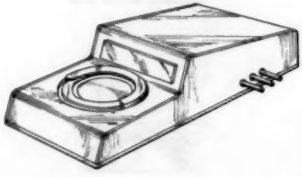
256,976
HOLDER FOR PRINTED WIRING BOARDS OR THE LIKE
William B. Webster, Huntington Beach, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Dec. 5, 1978, Ser. No. 966,671
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—140



256,977
DESK OR SIMILAR ARTICLE
Lawrence Lerner, New York, N.Y., and Fred Schmitt, Nutley, N.J., assignors to Litton Business Systems, Inc.
Division of Ser. No. 770,328, Feb. 22, 1977. This application Jun. 21, 1979, Ser. No. 50,769
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—161



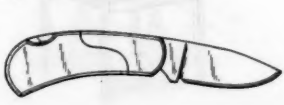
256,978
BEVERAGE HEATING APPARATUS
Amilcare Dogliotti, Alba, Italy, assignor to P. Ferrero & C. S.p.A., Alba, Italy
Filed Apr. 3, 1978, Ser. No. 893,109
Claims priority, application Italy, Oct. 14, 1977, 53571/77[U]
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D7—123



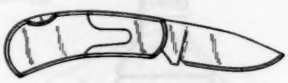
256,979
GARDEN TROWEL
Edward A. Nadle, Los Angeles, Calif., assignor to Enco Die Casting Co.
Filed Jul. 3, 1978, Ser. No. 921,602
Term of patent 14 years
Int. Cl. D8—*01;* D7—*99*
U.S. Cl. D8—10

256,980
IMPACT WRENCH
Edward H. Adams, and Gene E. Olson, both of Kenosha, Wis., assignors to Snap-On Tools Corporation, Kenosha, Wis.
Filed Dec. 22, 1977, Ser. No. 863,534
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—68

256,981
POCKETKNIFE
Shigeki Sakurai, 32, Midori-machi, Seki City, Gifu-ken, Japan
Filed Feb. 16, 1978, Ser. No. 878,201
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99

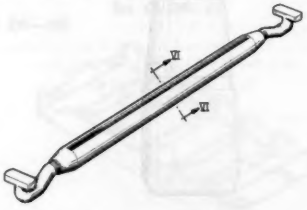


256,982
POCKETKNIFE
Shigeki Sakurai, 32, Midori-machi, Seki City, Gifu-ken, Japan
Filed Apr. 14, 1978, Ser. No. 896,662
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—99



256,983
KNIFE HANDLE
James W. Fogle, Indianapolis, Ind., assignor to Saran Industries, Inc., Indianapolis, Ind.
Filed Aug. 7, 1978, Ser. No. 931,828
Term of patent 14 years
Int. Cl. D08—*03*
U.S. Cl. D8—99

256,984
TURNBUCKLE, OR SIMILAR ARTICLE
Jukka W. Leppänen, Karlskoga, Sweden, assignor to Hasselfors Stainless Aktiebolag
Filed Sep. 8, 1978, Ser. No. 940,783
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349



256,985
WALL PLATE-BURLAP IN FRAME
Joan K. Creamer, and Donald DeLuca, both of Warwick, R.I., assignors to General Electric Company
Filed Oct. 6, 1975, Ser. No. 619,864
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—353

256,986
WALL PLATE
Joan Grieb, New York, N.Y., assignor to General Electric Company, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,035
Term of patent 14 years
Int. Cl. D8—*09*
U.S. Cl. D8—353

256,987
CURTAIN RUNNER
Kiyotsune Miki, Osaka, Japan, assignor to SM Industrial Company, Limited, Osaka, Japan
Filed Oct. 11, 1978, Ser. No. 950,315
Claims priority, application Japan, Apr. 21, 1978, 16239/78
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

256,988
CURTAIN RUNNER
Kiyotsune Miki, Osaka, Japan, assignor to SM Industrial Company, Limited, Osaka, Japan
Filed Oct. 11, 1978, Ser. No. 950,290
Claims priority, application Japan, May 8, 1978, 53-18655
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—367

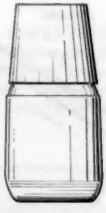
256,989
DISPENSING CONTAINER
Rudolf Kirchen, 67-10 108th St., Forest Hills, N.Y. 11375
Filed Jan. 30, 1978, Ser. No. 873,195
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—32

256,990
COMBINED BOTTLE AND PLASTIC WRAP
Gordon A. Strand, Waterville, Ohio, assignor to Owens-Illinois, Inc.
Filed Sep. 20, 1978, Ser. No. 944,104
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

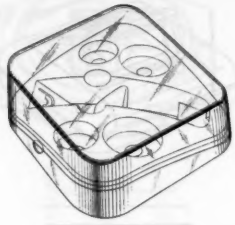
256,991
BOTTLE
Gordon A. Strand, Waterville, Ohio, assignor to Owens-Illinois, Inc.
Filed Sep. 20, 1978, Ser. No. 944,106
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—100

256,992
BOTTLE
Edward J. Kretz, Toledo, Ohio, assignor to Owens-Illinois, Inc.
Filed Sep. 11, 1978, Ser. No. 941,427
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—115

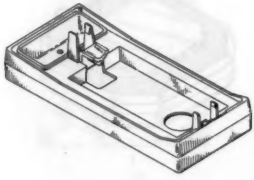
256,993
COMBINED BOTTLE AND PLASTIC WRAP
Gordon A. Strand, Waterville, Ohio, assignor to Owens-Illinois, Inc.
Filed Sep. 20, 1978, Ser. No. 944,105
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—147



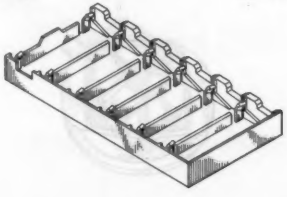
256,994
HOLDER FOR SKIN TREATMENT TOOL AND ACCESSORIES
Fran MacGregor, New Britain, Conn., assignor to Clairol Incorporated
Division of Ser. No. 852,388, Nov. 17, 1977, Pat. No. Des. 254,222. This application May 29, 1979, Ser. No. 43,063
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—185



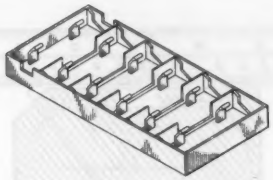
256,995
TRAY FOR RELEASABLY ENGAGING A RAZOR AND A BLADE CARTRIDGE DISPENSER
Ernest F. Kiraly, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 3, 1978, Ser. No. 921,917
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—186



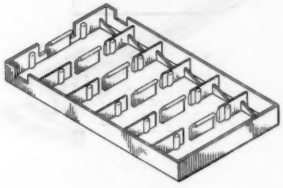
256,996
RAZOR BLADE CARTRIDGE DISPENSER
Ernest F. Kiraly, Fairfield, Conn., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 3, 1978, Ser. No. 921,914
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189



256,997
RAZOR BLADE CARTRIDGE DISPENSER
Vincent C. Motta, Bronx, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 3, 1978, Ser. No. 921,915
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189



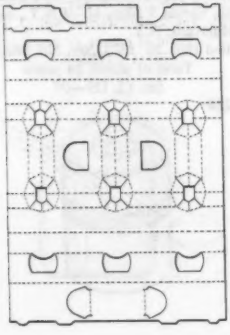
256,998
RAZOR BLADE CARTRIDGE DISPENSER
Vincent C. Motta, Bronx, N.Y., assignor to Warner-Lambert Company, Morris Plains, N.J.
Filed Jul. 3, 1978, Ser. No. 921,916
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—189



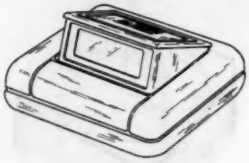
256,999
TWIST TIE DISPENSER
Anton Haagedoorn, Bedford; Leonard Spinozza, Carmel, and Philip Merlin, Spring Valley, all of N.Y., assignors to Alcar Industries, Harrison, N.Y.
Filed Dec. 20, 1977, Ser. No. 862,515
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—224

257,000
BELT PACKAGING TRAY
Larry J. Williams, Waverly, and Alvin A. Brhel, Lincoln, both of Nebr., assignors to The Goodyear Tire & Rubber Company
Filed Apr. 3, 1978, Ser. No. 892,730
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—242

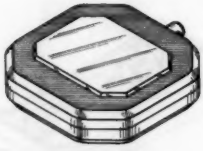
257,001
ARTICLE CARRIER BLANK
James R. Oliff, Austell, Ga., assignor to The Mead Corporation, Dayton, Ohio
Filed Dec. 4, 1978, Ser. No. 965,921
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—245



257,002
DIGITAL CLOCK HOUSING
Richard R. Nesbitt, Arlington, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Apr. 14, 1978, Ser. No. 896,404
Term of patent 14 years
Int. Cl. D10—*01*
U.S. Cl. D10—15

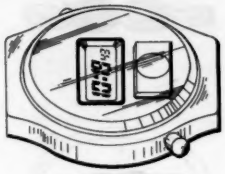


257,003
WATCH
Masafumi Yamagami, and Shinichi Yokoyama, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha
Filed Aug. 3, 1978, Ser. No. 930,736
Claims priority, application Japan, Feb. 15, 1978, 53-5463
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

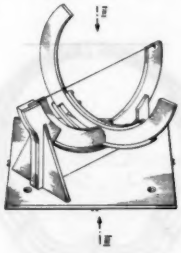


257,004
WATCH
Yoshihisa Ohie, Osaka, Japan, assignor to Sharp Kabushiki Kaisha
Filed Nov. 20, 1978, Ser. No. 962,152
Claims priority, application Japan, May 24, 1978, 53-21471
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—30

257,005
DIGITAL AWARD ENCASING WRISTWATCH
Fred D. Ruth, 501 E. Edgewood, Springfield, Mo. 65807
Filed Jun. 19, 1978, Ser. No. 916,708
Term of patent 14 years
Int. Cl. D10—*02*
U.S. Cl. D10—38



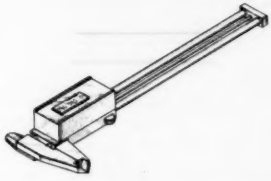
257,006
SUNDIAL
Cecil W. Santleben, 8 Hargraves St., North Entrance, New South Wales, 2261, Australia
Filed Jun. 6, 1978, Ser. No. 913,255
Term of patent 14 years
Int. Cl. D10—*03*
U.S. Cl. D10—45



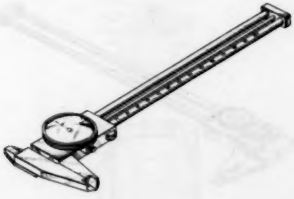
257,007
ROLLER MEASURE
Benjamin H. Stansbury, Jr., Beverly Hills, Calif., assignor to Ronco Teleproducts, Inc., Elk Grove Villate, Ill.
Filed Sep. 18, 1978, Ser. No. 944,210
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—70

257,008
TAPE RULE BLADE
William J. Hildebrandt, Simsbury, Conn., assignor to The Stanley Works
Filed Oct. 25, 1977, Ser. No. 845,141
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—71

257,009
DIGITAL SLIDE CALIPER
Kozo Sibukawa, and Goro Nishikata, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,546
Claims priority, application Japan, Aug. 7, 1978, 53-33120
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

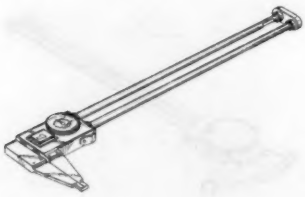


257,010
DIAL CALIPER
Kozo Sibukawa, and Goro Nishikata, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Feb. 5, 1979, Ser. No. 9,699
Claims priority, application Japan, Aug. 7, 1978, 53-33122
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



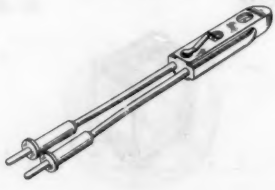
257,011
INSIDE MICROMETER
Tetsunori Tanada, Hiromachi, Japan, assignor to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Apr. 9, 1979, Ser. No. 28,556
Claims priority, application Japan, Oct. 8, 1978, 53-43842
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73

257,012
COMBINED DIGITAL AND DIAL SLIDE CALIPER
Kozo Sibukawa, and Goro Nishikata, both of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed May 16, 1979, Ser. No. 39,272
Claims priority, application Japan, Nov. 21, 1978, 53-49113
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—73



257,013
ENGINE EXHAUST EMISSION ANALYZER
James R. Shaffer, Mt. Prospect; David E. Maxwell, Cary, and Lee Radtke, Lake Zurich, all of Ill., assignors to Sun Electric Corporation, Crystal Lake, Ill.
Filed Jul. 28, 1978, Ser. No. 928,888
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78

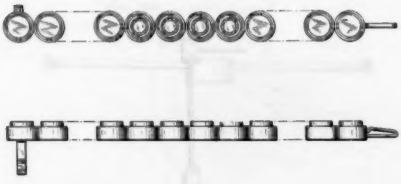
257,014
CIRCUIT TESTER
Robert C. Cressman, E. Greenwich, and Joseph P. Stefani, Warwick, both of R.I., assignors to General Electric Company
Filed Oct. 16, 1978, Ser. No. 951,531
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—78



257,015
BRACELET OR SIMILAR ARTICLE
Josef F. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Division of Ser. No. 841,746, Oct. 13, 1977, Pat. No. Des. 254,054. This application Jul. 19, 1979, Ser. No. 42,710
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—4

257,016
NECKLACE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Sep. 25, 1978, Ser. No. 945,575
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—16

257,017
BRACELET OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Jan. 12, 1979, Ser. No. 2,934
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—16



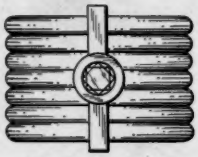
257,018
SPINNING FINGER RING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Nov. 17, 1978, Ser. No. 962,312
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—27

257,019
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Nov. 8, 1978, Ser. No. 958,565
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—29

257,020
FINGER RING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 4, 1978, Ser. No. 965,840
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—29

257,021
FINGER RING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Jan. 12, 1979, Ser. No. 2,935
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—34

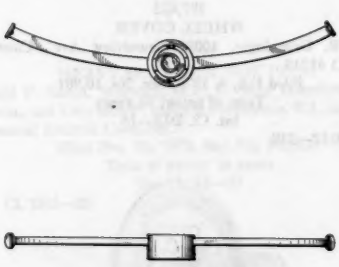
257,022
FINGER RING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Nov. 8, 1978, Ser. No. 958,566
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—35



257,023
EARRING OR SIMILAR ARTICLE
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Nov. 8, 1978, Ser. No. 958,897
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—43

257,024
DANGLE EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 4, 1978, Ser. No. 965,842
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—43

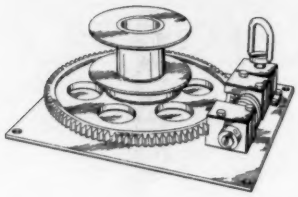
257,025
PENDANT
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Dec. 4, 1978, Ser. No. 965,841
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75



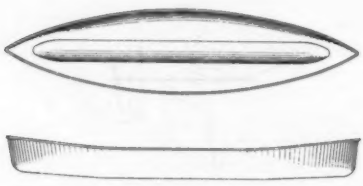
257,026
EARRING
Josef J. Barr, 125 Worth Ave., Palm Beach, Fla. 33480
Filed Jan. 12, 1979, Ser. No. 2,982
Term of patent 14 years
Int. Cl. D11—*01*
U.S. Cl. D11—75

257,027
COMBINED ASTROLOGICAL AND BLACK HERITAGE SYMBOLIC FIGURE
Harvey L. Jones, 829 Hubert St., Waco, Tex. 76704
Filed Aug. 23, 1978, Ser. No. 936,009
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

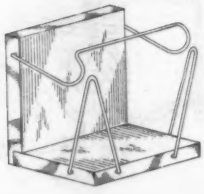
257,028
CEILING WINCH
Scott Row, 3720 Greenview Dr., Marietta, Ga. 30067
Filed Sep. 8, 1978, Ser. No. 940,869
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D12—54



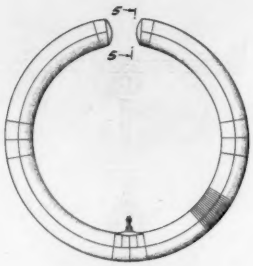
257,029
CANOE
Robert D. Gramprie, Oscoda, Mich., assignor to Sawyer Canoe Company, Oscoda, Mich.
Filed Mar. 3, 1978, Ser. No. 883,331
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—63



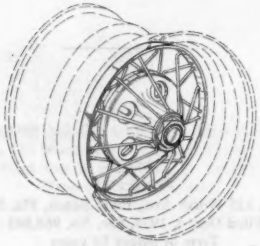
257,030
COMBINED FISHING FLOAT CARRIER AND RACK FOR ATTACHMENT TO BOATS
Joan K. Hutmacher, Box 73, Mead, Nebr. 68041
Filed Mar. 23, 1978, Ser. No. 889,312
Term of patent 14 years
Int. Cl. D12—*06*; D22—*05*
U.S. Cl. D12—70



257,031
PNEUMATIC TUBE
Claude E. Maynard, Jr., C/M Cycle Products, 320 E. Hobsonway, Blythe, Calif. 92225
Filed Aug. 29, 1977, Ser. No. 828,343
Term of patent 14 years
Int. Cl. D12—*15*
U.S. Cl. D12—153

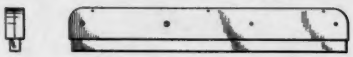


257,032
AUTOMOTIVE WHEEL CENTER
Richard G. Weld, 933 Mulberry, Kansas City, Mo. 64101
Continuation-in-part of Ser. No. 896,912, Apr. 17, 1978, abandoned. This application Jan. 24, 1979, Ser. No. 6,192
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D12—205

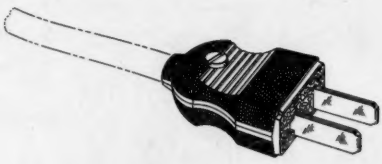


257,033
WHEEL COVER
Stanley B. Grueninger, 10097 Grandview Ave., Cincinnati, OhioIO 45215
Filed Feb. 9, 1979, Ser. No. 10,901
Term of patent 3½ years
Int. Cl. D12—*16*
U.S. Cl. D12—210

257,034
CIRCUIT TESTING CONNECTOR HEAD
Robert H. Knickerbocker, Cheshire, Conn., assignor to The Siemon Company, Watertown, Conn.
Filed Sep. 18, 1978, Ser. No. 943,229
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24

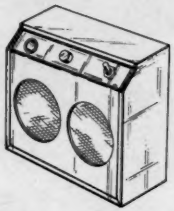


257,035
TWO PRONG ELECTRIC PLUG
Michael J. Ostrelich, Easton, Conn.; Donald F. Smith, Warwick, and Lawrence P. Mellyn, Providence, both of R.I., assignors to General Electric Company
Filed Dec. 26, 1978, Ser. No. 972,741
Term of patent 14 years
Int. Cl. 13—*03*
U.S. Cl. D13—28

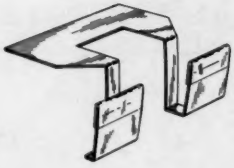


257,036
HEAVY DUTY ELECTRIC PLUG
Donald F. Smith, Warwick, R.I.; Michael Ostrelich, Easton, Conn., and Lawrence P. Mellyn, Providence, R.I., assignors to General Electric Company
Filed Dec. 26, 1978, Ser. No. 973,654
Term of patent 14 years
Int. Cl. 13—*03*
U.S. Cl. D13—28

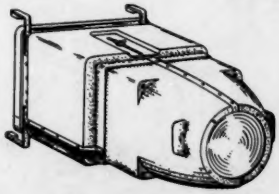
257,037
MINIATURE ELECTRIC GUITAR AMPLIFIER
Peter J. Skulski, P.O. Box 5583, Mission Hills, Calif. 91345
Filed Jun. 28, 1978, Ser. No. 919,990
Term of patent 14 years
Int. Cl. 14—*01, 03*
U.S. Cl. D14—34



257,038
BRACKET FOR PRINT HEAD
Harvey H. Leblanc, 12340 Olivier St., Montreal, Quebec, Canada (H4K 1V4)
Filed Mar. 20, 1978, Ser. No. 888,519
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—50



257,039
TELEVISION IMAGE PROJECTOR
Ross J. Petrie, Fort Lauderdale, Fla., assignor to Associated American Industries, Inc.
Filed Feb. 21, 1978, Ser. No. 879,688
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—84



257,040

FACSIMILE MACHINE

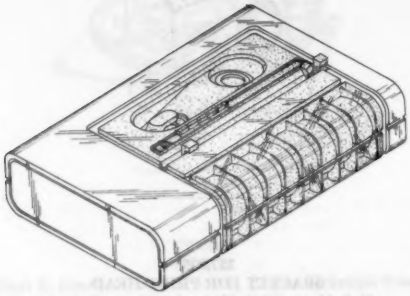
Robert W. Paterson, Southfield, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jun. 23, 1978, Ser. No. 918,498

Term of patent 14 years

Int. Cl. D14—*01*

U.S. Cl. D14—94



257,041

QUILTING FRAME

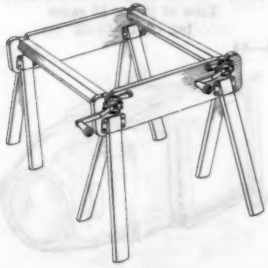
Orlan S. Nielsen, Box 101, Parker, Id. 83438; Lyle D. Nielsen, Box 555, and Lyle J. Nielsen, 105 W. 3rd North, both of St. Anthony, Id. 83445

Filed Jan. 31, 1979, Ser. No. 8,842

Term of patent 14 years

Int. Cl. D15—*06*

U.S. Cl. D15—66



257,042

MACHINE TOOL

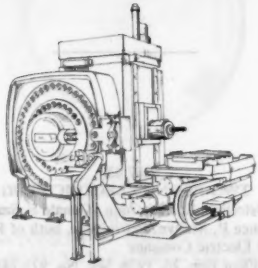
Earl R. Lohneis; Frank Zankl, both of Milwaukee; Clifford B. Stevens, Fox Point, and Thomas J. Green, West Bend, all of Wis., assignors to Kearney & Trecker Corporation, West Allis, Wis.

Filed Jul. 19, 1976, Ser. No. 706,911

Term of patent 14 years

Int. Cl. D15—*09*

U.S. Cl. D15—127



257,043

SHAFT POSITION TRANSDUCER HOUSING

Glenn R. Whiteley, Pasadena, Calif., assignor to Servo Products Company, Altadena, Calif.

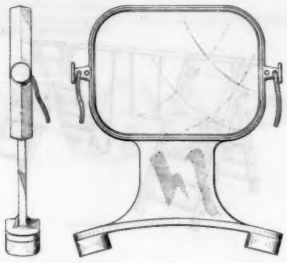
Filed Mar. 6, 1978, Ser. No. 884,019

Term of patent 14 years

Int. Cl. D15—*09*

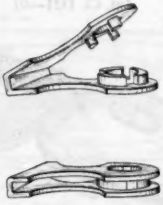
U.S. Cl. D15—131

257,044
MAGNIFIER
Edwin A. Speaker, Brockport, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.
Filed Apr. 10, 1978, Ser. No. 894,662
Term of patent 14 years
Int. Cl. D16—*08*
U.S. Cl. D16—54

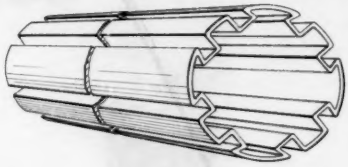


257,045
ELECTRONIC CALCULATING MACHINE
Matafumi Ikeda, and Tsutomu Yamasaki, both of Osaka, Japan, assignors to Sharp Kabushiki Kaisha, Japan
Filed Dec. 13, 1978, Ser. No. 969,052
Claims priority, application Japan, Jun. 23, 1978, 53/26470
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D18—7

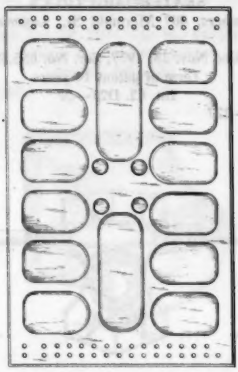
257,046
DOCUMENT CLIP
Rune J. Olsson, Höllviksnäs, Sweden, assignor to Produnik Aktiebolag
Filed May 4, 1978, Ser. No. 902,999
Claims priority, application Sweden, Nov. 7, 1977, 772253
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—65



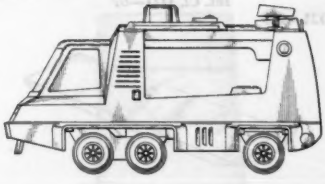
257,047
SIGNPOST WITH PROFILED CONFIGURATION
Saemund Stenersen, Kongsvinger, Norway, assignor to Norsk Hydro A.S., Oslo, Norway
Filed Nov. 10, 1977, Ser. No. 850,379
Claims priority, application Norway, May 12, 1977, 7758313
Term of patent 14 years
Int. Cl. D20—*03*; D25—*01*
U.S. Cl. D20—41



257,048
GAME BOARD
William D. Putnam, 838 Red Keg Ct., Midland, Mich. 48640
Filed May 12, 1978, Ser. No. 905,411
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—20



257,049
TOY VEHICLE
Tetsuo Okado, Tokyo, Japan, assignor to Tomy Kogyo Co., Inc., Tokyo, Japan
Filed Aug. 28, 1978, Ser. No. 937,609
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—134

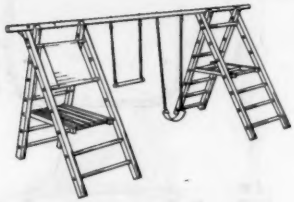


257,050
GOLFCLUB
Edward L. Cicero, 52-62 66 St., Maspeth, N.Y. 11378
Filed Aug. 15, 1977, Ser. No. 824,423
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—214

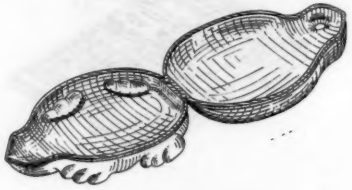
257,051
SKATEBOARD TRUCK
Jack R. Chambers, 407 Mermaid St., Laguna Beach, Calif. 92561
Filed Nov. 28, 1977, Ser. No. 855,597
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—227

257,052
SKI SHOE ATTACHMENT FOR SKATEBOARDS
Delbert Schrishuhn, Jr., 18808 E. Petunia, Azusa, Calif. 91702
Filed Jul. 10, 1978, Ser. No. 923,031
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D21—229

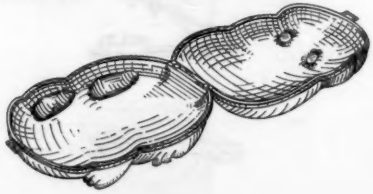
257,053
OUTDOOR PLAY DEVICE OR THE LIKE
James D. Ezell, P.O. Box 10272, Raleigh, N.C. 27605
Filed Sep. 5, 1978, Ser. No. 939,380
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D21—243



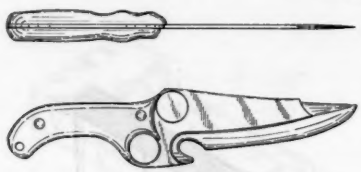
257,054
COMBINATION POOL AND SANDBOX
Bruno Ferretti, Woburn, Mass., assignor to Martin Yale Industries, Inc., Chicago, Ill.
Filed Dec. 8, 1978, Ser. No. 967,889
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—252



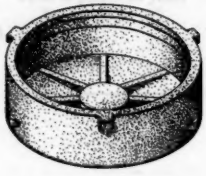
257,055
COMBINATION POOL AND SANDBOX
Bruno Ferretti, Woburn, Mass., assignor to Martin Yale Industries, Inc., Chicago, Ill.
Filed Dec. 8, 1978, Ser. No. 967,995
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—252



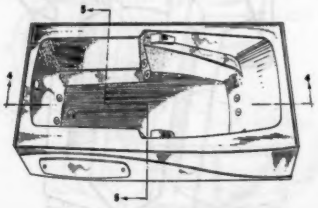
257,056
KNIFE
Jefferson Spivey, 5809 NW. 53rd, Oklahoma City, Okla. 73122
Filed Jun. 5, 1978, Ser. No. 912,237
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



257,057
PIPE TEST CAP
Duane D. Logsdon, 1708 Calavera Dr., Fullerton, Calif. 92631
Filed Aug. 15, 1977, Ser. No. 824,991
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—41

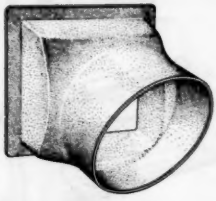


257,058
BATHTUB
Arthur S. Laver, 128 Country Club Dr., Hamilton, Ontario, Canada
Division of Ser. No. 800,096, May 24, 1977. This application Oct. 24, 1978, Ser. No. 954,165
Claims priority, application Canada, Apr. 5, 1977, 504773
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—55

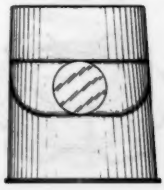


257,059
HEATER
Hans U. Schade, Pfuhl, Fed. Rep. of Germany, assignor to Firma Petz Electro, Switzerland
Filed May 1, 1978, Ser. No. 901,976
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1977, 1036
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—122

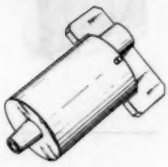
257,060
FAN HOUSING
Wilford R. Mann, Niles, Mich., assignor to AAA Associates Inc., Niles, Mich.
Filed Jun. 30, 1977, Ser. No. 812,002
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163



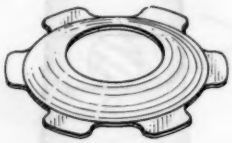
257,061
SOLID PARTICLE COLLECTING CONTAINER FOR A DENTAL EQUIPMENT STAND
Bo Ritzler, 27 A, Alpvägen, S-151 57 Södertälje, Sweden
Filed Mar. 21, 1977, Ser. No. 779,477
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—5



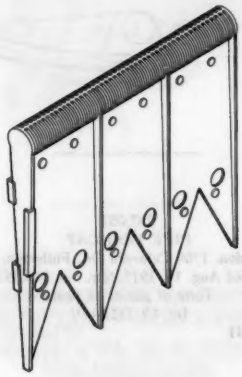
257,062
FLUID METERING VALVE FOR MEDICAL APPARATUS AND THE LIKE
Delbert D. Swartz, 4808 Asteria St., Torrance, Calif. 90503, and Masayuki Tamaya, 11232 Central Ave., South El Monte, Calif. 91733
Filed Jul. 24, 1978, Ser. No. 927,054
Term of patent 14 years
Int. Cl. D24—*02*; D23—*01*
U.S. Cl. D24—53



257,063
CONVEX INSERT FOR OSTOMY RECEPTACLE
Eugene R. Galindo, 2926 Highridge Rd., La Cresenta, Calif. 91214
Filed May 22, 1978, Ser. No. 908,210
Term of patent 14 years
Int. Cl. D24—*04*
U.S. Cl. D24—61

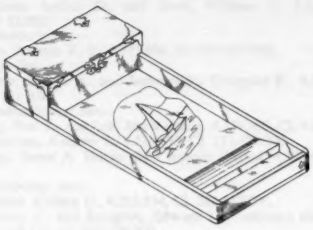


257,064
GARDEN BORDER UNIT
Frank R. Kobee, 100 Matador La., Apt. 806, Charlotte, N.C. 28209
Filed Sep. 15, 1978, Ser. No. 943,480
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—38



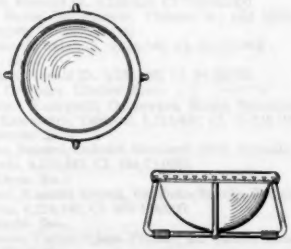
257,065
MULTI MOUNT POSITION LIGHT FIXTURE
Louis F. Silvestris, Bayonne, N.J., assignor to Keene Corporation, New York, N.Y.
Filed Jun. 21, 1978, Ser. No. 917,530
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—61

257,066
SEED SEPARATOR
James C. Lord, 3146 - 12th St., and Phillip P. Rosales, 1556 - 41st St., both of Rock Island, Ill. 61201
Filed Apr. 3, 1978, Ser. No. 893,163
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—51



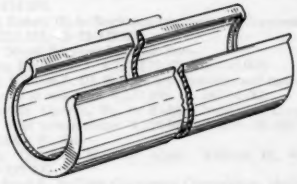
257,067
HAIR DRYER
Ronald L. Muller, New Milford, N.J., assignor to North American Philips Corporation, New York, N.Y.
Filed Sep. 5, 1978, Ser. No. 939,500
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—13

257,068
COMBINED PET DISH AND SUPPORT FRAME
Kathy S. Imhoff, 1609 Anita La., Newport Beach, Calif. 92660
Filed Feb. 5, 1979, Ser. No. 9,299
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



257,069
CRUCIFIX
Michael Wozniski, 507 N. 2nd St., Minersville, Pa. 17954
Filed Jun. 22, 1977, Ser. No. 808,847
Term of patent 14 years
Int. Cl. D31—*00*
U.S. Cl. D99—27

257,070
COIN HOLDER
Gordon W. Holmes, 1475 Larchview, Mississauga, Ontario, Canada
Filed Nov. 14, 1975, Ser. No. 632,139
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—34



257,071
SAVINGS BOX TOY
Hiroichi Yonezawa, 19-11, Nishikubo, Tokiwadaira, Matsudo-shi, Chiba, Japan
Filed Jun. 21, 1978, Ser. No. 917,681
Claims priority, application Japan, Dec. 21, 1977, 52-50188
Term of patent 14 years
Int. Cl. D99—*00*
U.S. Cl. D99—37

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LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

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AB Volvo: *See*—
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de Souza, Marcos H. C.; Barbosa, Celso A.; Falleiros, Ivan G. S.; Mori, Fabio Y.; and Viertler, Werner, 4,224,060, Cl. 75-124.000.

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Takada, Shunji; Akimura, Yoshitaka; Mifune, Hiroyuki; and Tsujino, Nobuyuki, 4,224,401, Cl. 430-437.000.

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Southam, Frederick W., 4,224,055, Cl. 75-10.00R.

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Lindman, William E.; and Alexander, John A., 4,224,148, Cl. 210-714.000.

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Alexander, William J., III. Surface wind batcher and method of collecting material in roll form. 4,223,850, Cl. 242-66.000.

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Szucs, Stephen S., 4,224,052, Cl. 71-105.000.

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American Monitor Corporation: *See*—
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American Optical Corporation: *See*—
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American Sunroof Corporation: *See*—
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Baldi, Luciano; Messori, Vittorio; and Francese, Renato, to Rumianca S.p.A. Process for the preparation of chloro-bis(alkylamino)-s-triazines. 4,224,444, Cl. 544-204.000.
Balle, Gerhard: *See—*
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Balouskus, Robert A.: *See—*
Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., 4,224,393, Cl. 429-251.000.
Balwe, Thomas: *See—*
Rostock, Kai; Birke, Johann; Wiedholz, Rudolf; Bauer, Johann; and Balwe, Thomas, 4,224,437, Cl. 528-500.000.
Ban, Itsuki; and Kanno, Hidenori, to Secoh Giken, Inc. Cartridge ejecting apparatus for magnetic tape players. 4,224,650, Cl. 360-137.000.
Bange, Joseph B., to Western States Machine Company, The. Cyclical centrifugal machine. 4,223,829, Cl. 233-24.000.
Bange, Joseph B.: *See—*
Laven, Thomas R.; Hurley, Donald L.; Bange, Joseph B.; and Wessel, Francis H., 4,224,165, Cl. 210-363.000.
Barber, Everett M.; Muenger, James R.; and Alexander, David L., to Texaco Inc. Combination chemical plant and Brayton-cycle power plant. 4,224,299, Cl. 423-360.000.
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Barcza, Sandor, to Sandoz, Inc. Substituted 1-oxa-4-aza-2,6-disilacyclohexanes and use thereof. 4,224,317, Cl. 424-184.000.
Barendsen, Pieter, to Atlas Copco Aktiebolag. Method of collecting dust during rock drilling and a dust collecting suction system for a rock drilling apparatus. 4,223,748, Cl. 175-66.000.
Barger, Frank L.: *See—*
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,224,673, Cl. 364-501.000.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,224,674, Cl. 364-501.000.
Barkhuus, Per W.; and Faldt, Inge, to Gotaverken Oresundsvarvet AB. Plant for the treatment of waste. 4,223,614, Cl. 110-238.000.
Barkley, Rich W.: *See—*
Smith, Randlow; MacLean, John P.; Williams, Dale; Barkley, Rich W.; and Jones, Henry B., 4,223,843, Cl. 239-558.000.
Barmag Barmer Maschinenfabrik Aktiengesellschaft: *See—*
Schippers, Heinz; and Lenk, Erich, 4,223,849, Cl. 242-46.400.
Barr, Thomas G., to Dowty Meco Limited. Longwall cutting machines with drum moved by plural power means. 4,223,950, Cl. 299-54.000.
Barroero, Louis F.; and Dekas, Socrates. Refrigerator door structure. 4,223,482, Cl. 49-386.000.
Barth, Gerald D.; and Durham, Walter T., to Illinois Tool Works Inc. Double-ended stud with combined driving and locking means. 4,223,585, Cl. 85-42.000.
Bartholomew, Lynn. Bailer for top head drive rotary well drills. 4,223,870, Cl. 254-334.000.
Bartles, James I., to Honeywell Inc. Fluid level detector test switch. 4,224,606, Cl. 340-514.000.
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Baumann, Manfred; and Hoffmann, Werner, 4,224,253, Cl. 568-445.000.
Lamm, Gunther, 4,224,220, Cl. 260-156.000.
Mueller, Herbert; Toussaint, Herbert; and Wittwer, Arnold, 4,224,251, Cl. 260-584.00R.
Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, 4,224,259, Cl. 264-11.000.
Sauer, Wolfgang; Fliege, Werner; Dudeck, Christian; and Petri, Norbert, 4,224,254, Cl. 568-431.000.
Staiger, Gerhard, 4,224,183, Cl. 252-429.00B.
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Basseches, Mark T. Pilfer prevention device. 4,223,542, Cl. 70-58.000.
Battelle Memorial Institute: *See—*
Schneider, Michel, 4,224,179, Cl. 252-316.000.
Battles, Donald D., to Cadre Corporation, The. Direct flame ladle heating method and apparatus. 4,223,873, Cl. 266-44.000.
Bauer Bros. Co., The: *See—*
Tantalo, Lawrence; Traver, Robert H.; and Lyons, William E., 4,223,847, Cl. 241-247.000.
Bauer, Johann: *See—*
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Bauman, Bernard D., to Air Products and Chemicals, Inc. Pretreatment of a reactor with alkali metal carbonate and bicarbonates to reduce wall fouling in vinyl chloride polymerization. 4,224,424, Cl. 526-62.000.
Baumann, Manfred; and Hoffmann, Werner, to BASF Aktiengesellschaft. Novel bicyclic scents. 4,224,253, Cl. 568-445.000.
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Baxter Travenol Laboratories, Inc.: *See—*
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.
Goldhaber, Richard P.; Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,224,163, Cl. 210-321.00B.
Terman, David S.; Cullis, Herbert M.; Khoja, Mirza A.; and Sullivan, Michael R., 4,223,672, Cl. 128-214.00R.
Williams, Ronald A., 4,223,675, Cl. 128-272.000.
Bayer Aktiengesellschaft: *See—*
Birkenstock, Udo; and Haydn, Josef, 4,224,248, Cl. 260-580.000.
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Hajek, Manfred; Wagner, Kuno; Moller, Friedrich; and Vehlewald, Peter, 4,224,417, Cl. 521-166.000.
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,224,269, Cl. 264-171.000.
Stadler, Peter; Metzger, Karl G.; Petersen, Uwe; and Voss, Eckart, 4,224,315, Cl. 424-180.000.
Bayerische Motoren Werke Aktiengesellschaft: *See—*
Gratza, Peter, 4,223,906, Cl. 280-301.000.
Liebegott, Klaus, 4,224,551, Cl. 313-323.000.
Bayssat, Michel; Sautel, Francis; Depin, Jean-Claude; and Betbeder Matibet, Annie, to Lipha, Lyonnaise Industrielle Pharmaceutique. 5-Substituted indan-2 carboxylic acid and functional derivatives. 4,224,341, Cl. 424-308.000.
BBC Brown, Boveri & Company Limited: *See—*
Fiorentzis, Michael, 4,224,652, Cl. 361-42.000.
Beachcroft Concrete Partitions Limited: *See—*
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Bean, Donald E.; Grymes, John R., Jr.; and Maine, Reuben E., to Sperry Corporation. Symbology writing apparatus for radar plan position indicator displays. 4,224,619, Cl. 343-5.0EM.
Beane, Russell R.: *See—*
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Beard, Colin C.: *See—*
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Schmider, Paul; Mandl, Herwig; and Ihlefeldt, Dietmar, 4,223,558, Cl. 73-421.00R.
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Beecham Group Limited: *See—*
Burbidge, Colin, 4,224,413, Cl. 435-284.000.
Fake, Charles S., 4,224,331, Cl. 424-263.000.
Beezer, Earl F., to Stelron Cam Company. Endless conveyor construction. 4,223,781, Cl. 198-793.000.
Beggs, George. Attachment for converting a vehicle into an expandible vehicle. 4,223,939, Cl. 296-26.000.
Beisner, Robert W.; and Winans, Stephen C., to Union Carbide Corporation. Rhodium catalyst regeneration by thermal treatment. 4,224,235, Cl. 260-449.00L.
Belcher, Claude A. Scale employing wheatstone-type bridges and strain gages. 4,223,752, Cl. 177-211.000.
Belisomi, Pietro, to Indesit Industria Elettrodomestici Italiana S.p.A. Digital synchronizing circuit. 4,224,639, Cl. 358-158.000.
Bell, Arlen W.: *See—*
Breen, Bernard P.; and Bell, Arlen W., 4,223,615, Cl. 110-264.000.
Bell, Francis D.: *See—*
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Bell, George E.; and Gowing, John P., to Flex-O-Lators Inc. Wire knotting machine. 4,223,705, Cl. 140-104.000.

Bell & Howell Company: *See—*
Stocker, Lester H., 4,223,882, Cl. 270-21.000.
Bell Telephone Laboratories, Incorporated: *See—*
Cauceglia, Walter B.; Dieterle, Walter H.; and Fay, Gerald B., 4,223,934, Cl. 294-15.000.
Crawford, Kenneth E., 4,224,479, Cl. 179-18.0DA.
Goldthorp, David C.; and Tuhy, Frank P., Jr., 4,224,654, Cl. 361-152.000.
Kaminski, William, 4,224,582, Cl. 333-173.000.
Krumreich, Charles L., 4,224,485, Cl. 200-51.100.
Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,223,978, Cl. 350-96.200.
Lese, Gregory; Liebler, Charles F.; and Patel, Dilipkumar B., 4,224,482, Cl. 179-157.000.
Miller, Anton J., 4,224,547, Cl. 310-312.000.
Neigh, James L.; and Sparber, Richard G., 4,224,483, Cl. 179-175.20R.
Perkinson, William B.; and Zies, Ray K., 4,224,477, Cl. 179-18.0ET.
Sosniak, Jacob; and Unger, Burton A., 4,224,565, Cl. 324-65.00R.
Tamburro, Peter J., 4,223,973, Cl. 339-186.00M.
Tuhy, Frank P., Jr., 4,224,476, Cl. 179-17.00E.
Zarount, Alfred, 4,224,472, Cl. 179-7.10R.
Bendix Corporation, The: *See—*
Grabb, Frederick G.; and Roberts, James K., 4,223,903, Cl. 280-96.100.
Turak, John L., 4,223,765, Cl. 188-79.50P.
Benedict, Bruce C., to Phillips Petroleum Company. Treatment of recycled ammonium sulfate-bisulfate solution. 4,224,142, Cl. 208-179.000.
Benner, Roland G.; and Henson, Paul D., to Mallinckrodt, Inc. Recovery of para-aminophenol. 4,224,247, Cl. 260-575.000.
Bentley, Billy E. Insulation stop. 4,223,489, Cl. 52-92.000.
Beppu, Tatsuro: *See—*
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Berger, Dieter: *See—*
Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, 4,224,277, Cl. 422-57.000.
Berger, Herman. Multihull sailing vessel having means for righting capsized vessels incorporated therein. 4,223,621, Cl. 114-61.000.
Bergey, James L.: *See—*
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Bergner, Robert L.: *See—*
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Bergwerksverband GmbH: *See—*
Flockenhaus, Claus, 4,224,109, Cl. 201-41.000.
zu Kocker, Heinz M.; and Tietze, Jurgen, 4,224,136, Cl. 208-8.0LE.
Berlioux, Jacques, to Societe Anonyme Francaise du Ferodo. Friction clutch plate assembly with torsion damping hub. 4,223,776, Cl. 192-106.200.
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Bernitt, Jurgen, to Dr.-Ing. Rudolf Hell GmbH. Gain control. 4,224,578, Cl. 330-138.000.
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Bertelsbeck, Helmut, to Daimler-Benz Aktiengesellschaft. Traffic system with automatically transversely controllable vehicles, especially for the local public passenger traffic. 4,223,756, Cl. 180-169.000.
Bertens, Theodorus C. J. M.: *See—*
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Betbeder Matibet, Annie: *See—*
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Bethell, Geoffrey S.: *See—*
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Bible, Harley V.; and Moon, William T., Jr., to Robertshaw Controls Company. Control unit and method of making the same. 4,223,701, Cl. 137-882.000.
Bidwell, Arthur W. Anode assembly for hot water heaters. 4,224,126, Cl. 204-197.000.
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Hansen, Elo H.; and Ruzicka, Jaromir, 4,224,033, Cl. 23-230.00R.
Bilek, Paul J.; Henning, William A.; McCluhan, Thomas K.; and Dong, Julian M., to Union Carbide Corporation. Method for reducing iron carbide formation in cast nodular iron. 4,224,064, Cl. 75-130.00R.
Binder, Dieter: *See—*
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Birkelbach, Donald F.: *See—*
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,224,186, Cl. 252-429.00C.
Birkenstock, Udo; and Haydn, Josef, to Bayer Aktiengesellschaft. Process for the depyrophorization of pyrophoric metal catalysts and uses thereof. 4,224,248, Cl. 260-580.000.
Birman, Josef. Shelf supports. 4,223,863, Cl. 248-246.000.
Bishop, Keith C., III, to Chevron Research Company. High-copper-level comulled sulfur sorbent. 4,224,191, Cl. 252-463.000.
Bissell, Holbrook C.: *See—*
Eyster, Charles G.; and Bissell, Holbrook C., 4,223,799, Cl. 220-230.000.
Black, John W., to Pemco-Kalamazoo, Inc. PVC Foil cutter. 4,223,511, Cl. 53-390.000.
Black, Noel S., to Brown Company. Adjustable bracket. 4,223,866, Cl. 249-211.000.
Black, Stanley A.: *See—*
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Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., to Caterpillar Tractor Co. Elevating scraper up-stop mechanism. 4,223,460, Cl. 37-8.000.
Blair, John T.; and Gleeson, Maurice J. Frameworks and like structures. 4,223,506, Cl. 52-644.000.
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Blanpied, Robert H.: *See—*
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Bleakney, Robert W., to Pierce Corporation. Corner watering circle move. 4,223,839, Cl. 239-177.000.
Bloom, Stephen R., to Perfection Automotive Products Corporation. Wide angle mirror attachment for vehicle side view mirrors. 4,223,983, Cl. 350-303.000.
Blum, Gunther: *See—*
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Blum, Victor: *See—*
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Blumhardt, Harold, to Blumhardt Mfg., Inc. Vehicle for agricultural use with transport wheels. 4,223,741, Cl. 172-240.000.
Blumhardt Mfg., Inc.: *See—*
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Boal, Leonard. Wire engager for chain link fence device and methods of making and using the same. 4,223,872, Cl. 256-58.000.
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Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann-Josef, 4,224,313, Cl. 424-94.000.
Bodine, Albert G.; and von Seggern, Ernest A. Rotary earth boring drill bit with centrifugal foreign particle barrier device. 4,223,749, Cl. 175-227.000.
Bodle, William W.; and Punwani, Dharamvir, to Institute of Gas Technology. Heat-efficient method for dewatering solids. 4,223,449, Cl. 34-9.000.
Bodor, Edward E.; and Payton, Joy T., to Texaco Inc. Method for cementing oil wells. 4,223,733, Cl. 166-293.000.
Boehringer Ingelheim GmbH: *See—*
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Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 4,224,438, Cl. 536-26.000.
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Boiten, Ebbe; and De Vries, Jochem J., to U.S. Philips Corporation. Shaving apparatus. 4,223,437, Cl. 30-43.600.
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, to Hoffmann-La Roche Inc. 9-Phenyl 5,6-dimethyl-nona-2,4,6,8 tetraenal or tetraenol derivatives. 4,224,244, Cl. 260-562.00R.
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Bontkowski, Stanley E.: *See—*
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Boogers, Wilhelmus P. L.; and Van Liempd, Albertus C. H., to B.V. Arenco P.M.B. Method and device for cutting a tobacco leaf into portions suitable for use as binders or wrappers. 4,223,684, Cl. 131-105.000.

Boorman, Roy S.: *See—*
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Borchard, Leslie J., to M.B.P. (S.A.) Pty. Limited. Tree shaker mounting. 4,223,515, Cl. 56-328.0TS.

Borden, George W.; Smith, Oliver W.; and Trecker, David J., to Union Carbide Corporation. Method for coating or printing using acrylated epoxidized soybean oil urethane compositions. 4,224,369, Cl. 428-203.000.

Borg-Warner Corporation: *See—*
Falk, John C., 4,224,207, Cl. 260-29.20E.

Borgeas, Alexander T. Heel shock absorber for footwear. 4,223,457, Cl. 36-35.00B.

Bormann, Dieter: *See—*
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Born, Raymond W. Mobile showroom with living quarters. 4,223,938, Cl. 296-21.000.

Bornstein, Lawrence J., to Aerojet-General Corporation. Dual thrust rocket motor. 4,223,606, Cl. 102-49.300.

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Boutet, Jean-Pierre L.; and Gueuret, Francois C., to Compagnie Francaise des Petroles. Production well-heads for underwater oil wells. 4,223,738, Cl. 166-368.000.

Bovenkerk, Harold P.; and Gigl, Paul D., to General Electric Company. Temperature resistant abrasive compact and method for making same. 4,224,380, Cl. 428-545.000.

BPB Industries Limited: *See—*
Pilgrim, Thomas A., 4,224,078, Cl. 106-110.000.

Bradbury, Harold M. Omni-directional transport device. 4,223,753, Cl. 180-6.200.

Braden, Ralph S.; and Kronenberger, Paul E., to White Consolidated Industries, Inc. Refrigerator compartment divider mounting. 4,223,538, Cl. 62-443.000.

Braithwaite, John C., to Vickers Shipbuilding Group Limited. Winch mechanism. 4,223,871, Cl. 254-291.000.

Brame, Frank H., to Boeing Company, The. Minimum safe altitude monitoring, indication and warning system. 4,224,669, Cl. 364-433.000.

Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of finely divided silicic acid by spray drying. 4,224,295, Cl. 423-335.000.

Brandt, Klaus: *See—*
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Branson Ultrasonics Corp.: *See—*
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Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., to NL Industries, Inc. Non-wicking polyurethane casting systems. 4,224,164, Cl. 210-321.00B.

Brawer, Seymour: *See—*
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Brearley, Malcolm; and White, Alfred K., to Girling Limited. Anti-lock brake control system I. 4,223,957, Cl. 303-106.000.

Breedis, John F.: *See—*
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Breen, Bernard P.; and Bell, Arlen W., to KVB, Inc. Low nox coal burner. 4,223,615, Cl. 110-264.000.

Brehm, Bernd; and Kluzik, Fritz, to Albert-Frankenthal AG. Quick-acting clamping device. 4,223,604, Cl. 101-415.100.

Brems, John H. Precision polygon generator. 4,223,568, Cl. 74-660.000.

Brems, John H. Work clamp and pallet combination. 4,223,880, Cl. 269-101.000.

Brendel, Thomas A.; and Turillon, Pierre P., to International Nickel Co., Inc., The. Wire forming process. 4,224,085, Cl. 148-11.50P.

Brenner, Barry S., to Eastman Kodak Company. Image-transfer processor. 4,223,991, Cl. 354-302.000.

Brevetti Umbria S.r.l.: *See—*
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Brewin, Peter R.: *See—*
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Bridger, Robert F.: *See—*
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Bridges, Robert D.: *See—*
Moreno, Carlos M.; and Bridges, Robert D., 4,224,130, Cl. 204-266.000.

Bridgestone Tire Company, Limited: *See—*
Iwata, Norio; and Kojima, Hiroshi, 4,223,712, Cl. 152-209.00D.

Briedis, Juozas, to Pentagon Industries, Inc. Braking system for reel-to-reel tape transport. 4,223,855, Cl. 242-204.000.

Brinkman, John A., to Rockwell International Corporation. Flowmeter. 4,223,557, Cl. 73-861.550.

British Industrial Plastics Limited: *See—*
Ogden, Dennis H.; and Inverarity, George, 4,224,423, Cl. 525-515.000.

British Petroleum Company Limited, The: *See—*
Foster, Alan I.; McCarroll, John J.; and Tennison, Stephen R., 4,224,192, Cl. 252-466.00B.

British Steel Corporation: *See—*
Hill, Kerry; and Butterworth, Edward, 4,223,442, Cl. 33-126.70A.
Pearson, Arthur E., 4,223,803, Cl. 222-3.000.

Britton, Robert W.: *See—*
Van Gaasbeek, Richard; and Britton, Robert W., 4,223,891, Cl. 273-186.00R.

Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F. Image intensifier. 4,224,511, Cl. 250-213.0VT.

Broadwin, Alan: *See—*
Wuchinich, David G.; Broadwin, Alan; and Andersen, Robert P., 4,223,676, Cl. 128-276.000.

Brodeur, Lester R.: *See—*
Mercer, William R.; Wurst, William C.; and Brodeur, Lester R., 4,224,623, Cl. 343-103.000.

Brokke, Bruce M.; and Sprain, Charles E., to Western Electric Company, Inc. Reel changeover apparatus for high speed strand takeup machines. 4,223,848, Cl. 242-25.00A.

Brook, David L., to S. G. Brown Limited, by said David L. Brook. Electric circuit device and pendulum unit incorporating such devices. 4,224,573, Cl. 328-1.000.

Brookes, Christopher J.: *See—*
Burley, David R.; and Brookes, Christopher J., 4,224,221, Cl. 260-202.000.

Brothers, Jack. Storing and dispensing means for hose and the like. 4,223,710, Cl. 150-0.500.

Brown, Arthur E. Rotary positive displacement machines. 4,224,016, Cl. 418-191.000.

Brown, Clyde M., Jr.: *See—*
Vickery, Earl C.; Schmoock, James C.; and Brown, Clyde M., Jr., 4,224,631, Cl. 357-13.000.

Brown Company: *See—*
Black, Noel S., 4,223,866, Cl. 249-211.000.

Brown, Harry J.; and Chopra, Kuldip S., to Union Carbide Corporation. Hard facing of metal substrates. 4,224,382, Cl. 428-656.000.

Brown, James L. Soft flying game disc. 4,223,473, Cl. 46-74.00D.

Brunet, Roger; and Marenco, Gerard, to Constructions Navales et Industrielles de la Mediterranee. Hinged floating caissons and unfolding devices therefor. 4,223,623, Cl. 114-77.00R.

Brunswick Corporation: *See—*
Chuan, Raymond L.; and Chen, Houston D., 4,223,559, Cl. 73-432.0PS.
Croisant, Elmer E.; and Sawyer, Kass W., 4,223,773, Cl. 192-48.910.

Bub, Robert A.: *See—*
Heckathorne, George E.; and Bub, Robert A., 4,223,626, Cl. 114-221.00A.

Bucher, Erich: *See—*
Konig, Gunter; Mutschler, Gunter; Scheutle, Erich; and Bucher, Erich, 4,223,519, Cl. 57-291.000.

Buchner, Norbert, to Robert Bosch GmbH. Method of packaging and sterilizing products. 4,223,512, Cl. 53-425.000.

Budnicki, Xavier B. Fuel delivery systems. 4,223,652, Cl. 123-440.000.

Buell, Bennett G., to American Cyanamid Company. Black dyes for ball-point pen inks. 4,224,071, Cl. 106-22.000.

Buergle, Peter; Maurer, Karl; Munzer, Manfred; Rosskopp, Wilhelm; and Wenzel, Franz, to Rohm GmbH. Partial polymerization method for vinyl monomers. 4,224,425, Cl. 526-85.000.

Buers, Hermann-Josef: *See—*
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann-Josef, 4,224,313, Cl. 424-94.000.

Buhler, Arthur; and Nedwed, Franz H., to Ciba-Geigy Corporation. Process for the dyeing and printing of paper materials in different hues using a single coupling component. 4,224,025, Cl. 8-466.000.

Buinicky, Ernest P.: *See—*
Estes, John H.; and Buinicky, Ernest P., 4,223,731, Cl. 166-272.000.

Bunnell, Edward D.; and Sotolongo, Thomas J., to AMP Incorporated. Liquid tight connector. 4,224,464, Cl. 174-65.00R.

Burbidge, Colin, to Beecham Group Limited. Cell culture method. 4,224,413, Cl. 435-284.000.

Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., to Petrolite Corporation. Process for clarifying aqueous systems employing quaternary ammonium adducts of polymerizable tertiary ammonium salts and acrylamide. 4,224,150, Cl. 210-735.000.

Burk, Emmett H., Jr.: *See—*
Masologites, George P.; Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,224,038, Cl. 44-1.0SR.

Burkhardt, Terry J.: *See—*
Langer, Arthur W., Jr.; Steger, John J.; and Burkhardt, Terry J., 4,224,182, Cl. 252-429.00B.

Burley, David R.; and Brookes, Christopher J., to American Cyanamid Company. Modifier composition for azo pigments based on 2-hydroxy-3-naphthoic acid. 4,224,221, Cl. 260-202.000.

Burmeister & Wain A/S: *See*—
Hansen, Erik, 4,223,824, Cl. 228-102.000.
Burnett, Ralph G., to American Casting and Manufacturing Corporation. Bank bag sealer. 4,223,424, Cl. 24-30.50R.
Burnham, Bradshaw; and Gustafson, Gary B., to Eastman Kodak Company. Reverse buckle scuff feeder. 4,223,884, Cl. 271-21.000.
Burnside, Orvin C., to University of Nebraska, The Board of Regents of the. Feedback controlled roller applicator. 4,223,479, Cl. 47-1.500.
Burroughs Corporation: *See*—
Templeton, William B., 4,223,885, Cl. 271-220.000.
Buschmann, Gerhard, to Jagenberg Werke Aktiengesellschaft. Apparatus for the pulsed dispensation of very small amounts of liquid, especially hydrogen peroxide. 4,223,806, Cl. 222-23.000.
Bush, Vincent N.; and Hiniker, Thomas K., to Hiniker Company. Combined data input and test circuit. 4,224,466, Cl. 178-69.00G.
Butruille, Yves: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,224,094, Cl. 156-169.000.
Butterworth, Edward: *See*—
Hill, Kerry; and Butterworth, Edward, 4,223,442, Cl. 33-126.70A.
Buttigieg, Philip. Filler tube and filter attachment unit for fuel. 4,224,167, Cl. 210-460.000.
Buttiglione, Guido: *See*—
La Scala, William; and Buttiglione, Guido, 4,223,840, Cl. 239-207.000.
B.V. Arenco P.M.B.: *See*—
Boogers, Wilhelmus P. L.; and Van Liempd, Albertus C. H., 4,223,684, Cl. 131-105.000.
Cablecraft, Inc.: *See*—
Fawcett, Harry E., 4,223,564, Cl. 74-501.00R.
Cadre Corporation, The: *See*—
Battles, Donald D., 4,223,873, Cl. 266-44.000.
Cadwallader, James W., to SPS Technologies, Inc. Apparatus for making self-locking fasteners with a pressure rolled thermoplastic patch. 4,223,632, Cl. 118-58.000.
Calder, Howard B., Jr. Masking level difference adaptor for audiometers. 4,224,468, Cl. 179-1.00N.
Caldwell, Paul L., Jr.; and Snavely, Earl S., Jr., to Mobil Oil Corporation. Petroleum production technique utilizing a hot aqueous fluid. 4,223,735, Cl. 166-303.000.
California Institute of Technology: *See*—
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,224,198, Cl. 260-8.000.
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, 4,224,359, Cl. 427-221.000.
Calundann, Gordon W.; and Charbonneau, Larry F., to Celanese Corporation. Thermotropic polyesters of 2,6-dihydroxyanthraquinone. 4,224,433, Cl. 528-128.000.
Camaggi, Giovanni: *See*—
Colle, Roberto; Gozzo, Franco; Camaggi, Giovanni; and Siddi, Giorgio, 4,224,050, Cl. 71-98.000.
Cambro AG: *See*—
Riede, Gerhard, 4,224,159, Cl. 210-232.000.
Cameron Iron Works, Inc.: *See*—
Jones, Marvin R., 4,223,700, Cl. 137-874.000.
Campbell, Eugene H., to National Semiconductor Corporation. Display stabilization circuit. 4,224,569, Cl. 324-78.00D.
Campbell, Henry F.; Santora, Norman F.; and Douglas, George H., to William H. Rorer, Inc. Anti-inflammatory compositions containing α-phenyl-N-phenylnitrone compounds. 4,224,340, Cl. 424-304.000.
Canon Kabushiki Kaisha: *See*—
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,223,987, Cl. 354-23.00D.
Carlson, Torsten S. Automatic periodic drug dispensing system. 4,223,801, Cl. 221-3.000.
Carmichael, Leo G.; and Carmichael, Robert F. Ceiling mounted solar heat collector. 4,223,663, Cl. 126-426.000.
Carmichael, Robert F.: *See*—
Carmichael, Leo G.; and Carmichael, Robert F., 4,223,663, Cl. 126-426.000.
Carr Cedar Products, Inc.: *See*—
Carr, Charles E., 4,223,432, Cl. 29-417.000.
Carr, Charles E., to Carr Cedar Products, Inc. Shim bundle and method of making the same. 4,223,432, Cl. 29-417.000.
Carriay, Jean; and de Lautrec, Jacques, to Societe National Elf Aquitaine (Production). Microemulsions for use as spaces in well cementation. 4,223,732, Cl. 166-291.000.
Carter Equipment Co., Inc.: *See*—
Carter, William D.; and Mueller, Martin S., 4,223,985, Cl. 352-222.000.
Carter-Wallace, Inc.: *See*—
Darrow, William R.; and Dunn, James M., 4,224,323, Cl. 424-248.560.
Stiefel, Frank J., 4,224,443, Cl. 544-95.000.
Carter, William D.; and Mueller, Martin S., to Carter Equipment Co., Inc. Method and apparatus for protecting a film gate against dirt while changing films. 4,223,985, Cl. 352-222.000.
Cascade Corporation: *See*—
Olson, John E., 4,224,657, Cl. 362-67.000.
Case, Barton C.: *See*—
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., 4,224,164, Cl. 210-321.00B.
Casey, Joseph M.; and Dahlin, Erik B., to Measurex Corporation. Apparatus for the on-line measurement of the opacity of a paper sheet. 4,224,513, Cl. 250-216.000.
Cash, David R., to James Cash Machine Co. Filling machine for sleeping bags, comforters and the like. 4,223,510, Cl. 53-258.000.
Castarede, Armand, to Regie Nationale des Usines Renault. Slanted internal combustion engine. 4,223,647, Cl. 123-59.00A.
Caswell, Richard L.; and Todd, John A., to Dresser Industries, Inc. Multiple product gasoline dispenser. 4,223,807, Cl. 222-28.000.
Catalucci, Enrico, to Lonza Ltd. Process for the production of methotrexate. 4,224,446, Cl. 544-257.000.
Caterpillar Tractor Co.: *See*—
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,223,460, Cl. 37-8.000.
Isaia, Robert L.; Bell, Francis D.; and Shelby, Robert L., 4,223,878, Cl. 267-34.000.
Ostrowski, Richard C., 4,223,716, Cl. 164-26.000.
Cau, Alain A.: *See*—
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.
Cauceglia, Walter B.; Dieterle, Walter H.; and Fay, Gerald B., to Bell Telephone Laboratories, Incorporated. Tool to insert and extract printed circuit boards into and out of apparatus housing connectors. 4,223,934, Cl. 294-15.000.
Cavallaro, Antonino: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Malgeri, Domenico; and Cavallaro, Antonino, 4,224,210, Cl. 260-32.60N.
Cavitron Corporation: *See*—
Wuchinich, David G.; Broadwin, Alan; and Andersen, Robert P., 4,223,676, Cl. 128-276.000.
Cavitt, Stanley B., to Texaco Development Corp. Process for preparing an ethylene oxide catalyst. 4,224,194, Cl. 252-476.000.
Cazzaro, Giorgio; Matera, Giancarlo; Malgeri, Domenico; and Cavallaro, Antonino, to SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A. Fiber from acrylonitrile copolymers having reduced inflammability, compositions and processes for manufacturing the same. 4,224,210, Cl. 260-32.60N.
CCL Systems Limited: *See*—
Edwards, Hugh J. W., 4,223,497, Cl. 52-230.000.
Cecil, James B.: *See*—
Dobkin, Robert C.; Cecil, James B.; and Connolly, Joseph J., Jr., 4,224,564, Cl. 323-74.000.
Celanese Corporation: *See*—
Calundann, Gordon W.; and Charbonneau, Larry F., 4,224,433, Cl. 528-128.000.
Vanderspurt, Thomas H., 4,224,187, Cl. 252-437.000.
Vanderspurt, Thomas H., 4,224,193, Cl. 252-468.000.
Cellwood Grubbens AB: *See*—
Skardal, Karl A., 4,224,145, Cl. 209-211.000.
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Antibiotics produced by species of Nocardia. 4,224,314, Cl. 424-122.000.
Centro Ricerche Fiat S.p.A.: *See*—
Arietti, Giulio; and Lombardi, Claudio, 4,223,655, Cl. 123-463.000.
Cha, Chang Y., to Occidental Oil Shale, Inc. Determining the locus of a processing zone in an oil shale retort by effluent water composition. 4,223,726, Cl. 166-251.000.
Chabot, Gerard. Toy shovel. 4,224,007, Cl. 414-694.000.
Chambers, Hubert H.; and Tear, Brian J., to Laporte Industries Ltd. Method of treating inorganic oxide pigments. 4,224,080, Cl. 106-308.00Q.
Chambers, John M. Drying process and apparatus for accomplishing the same. 4,223,452, Cl. 34-28.000.
Champion International Corporation: *See*—
Thompson, Kenneth P.; Ihde, Richard C.; and Roth, Clarence E., 4,224,092, Cl. 156-82.000.
Chan, David C. K.: *See*—
Reynolds, Richard N., Jr.; Ziman, Stephen D.; and Chan, David C. K., 4,224,453, Cl. 549-63.000.
Charbonneau, Larry F.: *See*—
Calundann, Gordon W.; and Charbonneau, Larry F., 4,224,433, Cl. 528-128.000.
Charransol, Pierre; Athenes, Claude; and Salle, Jacques, to Thomson-CSF. Time division switching network. 4,224,475, Cl. 370-59.000.
Chase Bag Company: *See*—
Dunn, Edward C., Jr.; Hickman, Louis S.; and Penny, Thomas D., 4,223,883, Cl. 271-11.000.
Chemap AG: *See*—
Muller, Hans, 4,224,153, Cl. 210-780.000.
Chemetals Corporation: *See*—
DeCraene, Denis F., 4,224,119, Cl. 204-64.00R.
Chemplex Company: *See*—
Kirch, William; and Thompson, Paul A., 4,224,428, Cl. 526-106.000.
Chen, Houston D.: *See*—
Chuan, Raymond L.; and Chen, Houston D., 4,223,559, Cl. 73-432.0PS.
Chen, Yu-Tsai, to Standard Oil Company (Indiana). Injection molding of amic acid and amide-imide polymers and molding compositions. 4,224,214, Cl. 260-37.00N.
Cheng, Charles C. K., to NCR Corporation. Holographic scanning system. 4,224,509, Cl. 235-457.000.
Cheng, Paul J., to Phillips Petroleum Company. Carbon black reactor. 4,224,284, Cl. 422-156.000.
Cheung, Peter P. L., to Pennwalt Corporation. Dental restorative kit and method of restoring tooth structure. 4,224,023, Cl. 433-216.000.
Chevron Research Company: *See*—
Bishop, Keith C., III, 4,224,191, Cl. 252-463.000.

Reynolds, Richard N., Jr.; Ziman, Stephen D.; and Chan, David C. K., 4,224,453, Cl. 549-63.000.
Chiarelli Etudes et Realisations Mecaniques et Electroniques: *See*—
Leleu, Rene O.; and Cormault, Pierre J. B., 4,224,672, Cl. 346-33.00R.
Chiba, Ryuichi: *See*—
Ohnishi, Keizo; Adachi, Takao; Fuji, Akiyoshi; and Chiba, Ryuichi, 4,224,360, Cl. 427-239.000.
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; Watanabe, Taizo; and Fujimura, Motoki, to Tanabe Seiyaku Co., Ltd. Immobilized aminoacylase. 4,224,411, Cl. 435-177.000.
Childs, William V., to Phillips Petroleum Company. Recovery of 1,1-dihydroheptafluorobutanol from water by distillation. 4,224,112, Cl. 203-18.000.
Choate, Albert G., to Automation Gages, Inc. Surface illuminator. 4,223,986, Cl. 353-80.000.
Cholin, John M., to Firetek Corporation. Series supervision/parallel actuation device. 4,224,538, Cl. 307-317.00R.
Chopra, Kuldip S.: *See*—
Brown, Harry J.; and Chopra, Kuldip S., 4,224,382, Cl. 428-656.000.
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., to Merck & Co., Inc. 3-(2-Aminoethylthio)-6-amido-7-oxo-1-azabicyclo[3.2.0]-hept-2-ene-2-carboxylic acid. 4,224,336, Cl. 424-274.000.
Christian, Danny J.: *See*—
Gammage, Richard B.; Thorngate, John H.; and Christian, Danny J., 4,224,519, Cl. 250-337.000.
Christian Rovsing A/S: *See*—
Seiersen, Ole S., 4,224,620, Cl. 343-5.0VQ.
Chrysler Corporation: *See*—
Stafford, Douglas J., 4,223,483, Cl. 49-386.000.
Chu, Kwo R.: *See*—
Granatstein, Victor L.; Sprangle, Phillip; Drobot, Adam T.; Chu, Kwo R.; and Safter, J. Laurence, 4,224,576, Cl. 330-4.000.
Chuan, Raymond L.; and Chen, Houston D., to Brunswick Corporation. Apparatus and methods for detecting an incipient fire condition. 4,223,559, Cl. 73-432.0PS.
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M. Externally commutated compensation-type converter system and method of forced commutation and blocking of rectifiers thereof. 4,224,661, Cl. 363-71.000.
Chukhchin, Nikolai F.: *See*—
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Ciancibello, Carmine A.; and Munter, Ernst A., to Northern Telecom Limited. Digital conference circuit. 4,224,688, Cl. 370-62.000.
Ciba-Geigy Corporation: *See*—
Adam, Jean-Marie, 4,224,228, Cl. 260-372.000.
Buhler, Arthur; and Nedwed, Franz H., 4,224,025, Cl. 8-466.000.
Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, 4,224,337, Cl. 424-279.000.
Mueller, Karl F.; Heiber, Sonia J.; and Plankl, Walter L., 4,224,427, Cl. 526-93.000.
Ciliberti, Frank L., Jr.; and Kaye, Gordon E., to P. R. Mallory & Co. Inc. Expandable battery case. 4,224,385, Cl. 429-66.000.
Cislak, Raymond S., to Gateway Industries, Inc. Automatic bobbin changer and apparatus for a sewing machine. 4,223,618, Cl. 112-186.000.
Citizen Watch Co., Ltd.: *See*—
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,224,531, Cl. 307-221.00C.
Nakagawa, Hisahide, 4,223,524, Cl. 368-156.000.
Nakayama, Yasuaki, 4,224,387, Cl. 429-133.000.
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,223,522, Cl. 368-66.000.
Saitoh, Mituo; and Kamiyama, Yasuo, 4,223,521, Cl. 368-204.000.
Tutiya, Hidetaka; and Waki, Masahiko, 4,223,527, Cl. 368-283.000.
Claflin, Warren E.: *See*—
Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,497, Cl. 219-121.0LM.
Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,498, Cl. 219-121.00L.
Clapot, Claude; Dumont, Louis; and Vial, Jean, to Philagro, service Brevets. Methional derivatives and compositions with a growth-regulating effect upon plants. 4,224,051, Cl. 71-98.000.
Clarion Co., Ltd.: *See*—
Umezawa, Hiroyuki; Ito, Masao; and Okada, Hitoshi, 4,224,647, Cl. 360-96.300.
Clark, Howard K.; and Wilson, Archie A. Insulation molded, load bearing, prefabricated panels. 4,223,500, Cl. 52-309.400.
Claycomb, Jack R. Pressure pulse detection apparatus incorporating noise reduction feature. 4,224,687, Cl. 367-83.000.
Clayton, Maurice A. Fire fighting nozzle units. 4,223,740, Cl. 169-70.000.
Clemence, Francois; Humbert, Daniel; and Fournex, Robert, to Roussel Uclaf. Antihypertensive 2H-indol-2-ones. 4,224,333, Cl. 424-267.000.
Clevepak Corporation: *See*—
Molvar, Allen E., 4,224,158, Cl. 210-220.000.
Clifton, Kenneth C.: *See*—
Faddis, Terry N.; Clifton, Kenneth C.; and Sweet, Robert A., 4,223,603, Cl. 101-138.000.
Cline, Harvey E.: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,224,594, Cl. 338-32.00R.
Erikson, Carl A.; Anthony, Thomas R.; Cline, Harvey E.; Ludke, Siegwalt; and Fielding, John O., 4,224,504, Cl. 219-388.000.
Clitheroe, Thomas, to Edgar Pickering (Blackburn) Limited. Yarn compensator for a multicolor yarn warp printer. 4,223,822, Cl. 226-118.000.
Cobe Laboratories, Inc.: *See*—
Goyne, Thomas E.; Herman, Stephen J.; Giurtino, Joel F.; and Anderson, Robert L., 4,223,921, Cl. 285-26.000.
Codman & Shurtleff, Inc.: *See*—
Gatturna, Roland, 4,223,969, Cl. 339-15.000.
Cohen, Jacques. Shoe sole assembly. 4,223,456, Cl. 36-29.000.
Coker, Thomas G.: *See*—
Dempsey, Russell M.; Coker, Thomas G.; LaConti, Anthony B.; and Fragala, Anthony R., 4,224,121, Cl. 204-98.000.
Colgate-Palmolive Company: *See*—
Gaffar, Abdul; and Grecsek, John J., 4,224,308, Cl. 424-49.000.
Gaffar, Abdul; and Grecsek, John J., 4,224,309, Cl. 424-54.000.
Wixon, Harold E., 4,224,250, Cl. 260-584.00R.
Colle, Roberto; Gozzo, Franco; Camaggi, Giovanni; and Siddi, Giorgio, to Montedison S.p.A. Chloroacetanilides having a selective herbicidal activity, ortho-alkenyl-substituted anilines, intermediates in the synthesis of said herbicidal chloroacetanilides, and methods for their preparation. 4,224,050, Cl. 71-98.000.
Colt Industries Operating Corp: *See*—
Eshelman, Philip V.; and Herman, Ronald E., 4,223,651, Cl. 123-438.000.
Columbus McKinnon Corporation: *See*—
Ulbing, Otmar M., 4,223,554, Cl. 73-133.00R.
Combustion Engineering, Inc.: *See*—
Markiewicz, Jan, 4,223,581, Cl. 83-167.000.
Pope, Kenneth E., 4,224,124, Cl. 204-186.000.
Wendland, William G., 4,224,160, Cl. 210-236.000.
Commissariat a l'Energie Atomique: *See*—
Delafosse, Jacques, 4,224,106, Cl. 176-75.000.
Delafosse, Jacques; and Feutrel, Claude, 4,224,107, Cl. 176-78.000.
Commonwealth Scientific and Industrial Research Organization: *See*—
Mamers, Heikki; and Menz, David N. J., 4,224,102, Cl. 162-5.000.
Compagnie Europeenne pour l'Equipement Menager "Cepem": *See*—
Gernez, Alain, 4,224,132, Cl. 204-279.000.
Compagnie Francaise des Petroles: *See*—
Boutet, Jean-Pierre L.; and Gueuret, Francois C., 4,223,738, Cl. 166-368.000.
Marais, Lionel R., 4,223,747, Cl. 175-65.000.
Compagnie Internationale pour l'Informatique Cii-Honeywell Bull: *See*—
Giraud, Georges J. L., 4,224,666, Cl. 364-200.000.
Compo Industries, Inc.: *See*—
Veiga, Manuel J.; and Petersen, Richard E., 4,224,375, Cl. 428-315.000.
Concast AG: *See*—
Riederer, Hans; Fuchs, Adolf; and Vial, Raymond, 4,223,719, Cl. 164-448.000.
Streubel, Hans, 4,223,715, Cl. 164-1.000.
Conner, David E.; Hoffman, Charles R.; and Laakso, Melvin T., to International Business Machines Corporation. Receive/bypass circuit for subsystems in polling system. 4,224,684, Cl. 364-900.000.
Connolly, Joseph J., Jr.: *See*—
Dobkin, Robert C.; Cecil, James B.; and Connolly, Joseph J., Jr., 4,224,564, Cl. 323-74.000.
Construction Technology, Inc.: *See*—
St. Louis, Paul T., 4,224,003, Cl. 404-133.000.
Constructions Navales et Industrielles de la Mediterranee: *See*—
Brunet, Roger; and Marenco, Gerard, 4,223,623, Cl. 114-77.00R.
Control Data Corporation: *See*—
Roling, William J., 4,224,648, Cl. 360-97.000.
Cook, James. Drain line for recreational vehicles. 4,223,702, Cl. 138-106.000.
Cook Paint and Varnish Company: *See*—
Johnson, Steven D., 4,224,213, Cl. 260-37.0SB.
Cooper, Glenn D.; and Katchman, Arthur, to General Electric Company. Polyphenylene ether resin compositions containing poly(alkylene oxides) and phosphate plasticizer. 4,224,209, Cl. 260-30.60R.
Cooper Industries, Inc.: *See*—
Workman, William, Jr., 4,223,745, Cl. 173-12.000.
Cooper, Robin D. G.; and Herron, David K., to Eli Lilly and Company. 7-Ureido acetamido substituted cephalosporin antibiotics. 4,224,442, Cl. 544-27.000.
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., to NL Industries, Inc. Hair compositions containing castor based quaternaries. 4,224,312, Cl. 424-70.000.
Copco, Inc.: *See*—
Jorgensen, Carsten, 4,223,936, Cl. 294-16.000.
Coppola, Vincent G.; Grisgraber, Edwin G.; and Lorenzo, John L., to Pitney Bowes Inc. Electronic counter with non-volatile memory. 4,224,506, Cl. 235-92.0FP.
Cormault, Pierre J. B.: *See*—
Leleu, Rene O.; and Cormault, Pierre J. B., 4,224,672, Cl. 346-33.00R.

Cornell, Douglas W.: *See—*
Tsang, Wing; Walker, James A.; and Cornell, Douglas W., 4,224,279, Cl. 422-78.000.

Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., to Sperry Corporation. PPI Display for radar and synthetic symbology. 4,224,621, Cl. 343-5.0EM.

Corning Glass Works: *See—*
Reade, Richard F., 4,224,074, Cl. 106-48.000.

Corradi, Arielio R.: *See—*
Montino, Franco; Corradi, Ariello R.; and Nonato, Erminio, 4,224,175, Cl. 252-62.560.

Costello, John E.: *See—*
Costello, Michael; and Costello, John E., 4,223,930, Cl. 292-346.000.

Costello, Michael; and Costello, John E., to Meridian Safety Products, Inc. Security device for window locks. 4,223,930, Cl. 292-346.000.

Coutin, Pierre F.: *See—*
Duclos, Didier A.; and Coutin, Pierre F., 4,223,763, Cl. 188-1.00C.

Covey, Geoffrey H.; and Algar, William H., to Australian Paper Manufacturers Limited. Alkali regeneration process. 4,224,289, Cl. 423-155.000.

Cox, Charlie O. Portable collapsible vehicle roof mounted sleeping compartment. 4,223,689, Cl. 135-1.00A.

Coy, David H.: *See—*
Meyers, Chester A.; Coy, David H.; and Schally, Andrew V., 4,224,199, Cl. 260-8.000.

Cramer, Judith C. Restraint for use in performing a lumbar puncture. 4,223,670, Cl. 128-134.000.

Cramwinckel, Hans: *See—*
de Bijl, Adrianus M. J.; and Cramwinckel, Hans, 4,224,665, Cl. 364-200.000.

Crane Co.: *See—*
Sherlaw, Michael, 4,223,430, Cl. 29-157.10R.

Crawford, Kenneth E., to Bell Telephone Laboratories, Incorporated. Method of controlling call traffic in a communication switching system. 4,224,479, Cl. 179-18.0DA.

Crawford, Steven D.: *See—*
Pemberton, Mark S.; and Crawford, Steven D., 4,224,410, Cl. 435-162.000.

Crean, Peter A., to Xerox Corporation. Electrostatic lens for ink jets. 4,224,523, Cl. 250-396.00R.

Cremer, Heinz P., to Keiper Automobiltechnik GmbH & Co. KG. Hinge fittings for vehicle seats. 4,223,947, Cl. 297-367.000.

Cresswell, Michael W., to Westinghouse Electric Corp. Dynamic isolation of conductivity modulation states in integrated circuits. 4,224,083, Cl. 148-1.500.

Croisant, Elmer E.; and Sawyer, Kass W., to Brunswick Corporation. Drive engaging apparatus. 4,223,773, Cl. 192-48.910.

Croissant, Carl W., Jr., to Ford Aerospace & Communications Corp. Adjustable mount for gun pod and the like. 4,223,591, Cl. 89-37.50L.

Crooks, James H.: *See—*
Stokes, John J., Jr.; and Crooks, James H., 4,224,086, Cl. 148-26.000.

Cruickshank, David G.; and Muniz, Jose M., to Western Electric Company, Inc. Method for adjusting electrical devices. 4,224,500, Cl. 219-121.0LE.

Cruse, Oliver B., to Wagner Electric Corporation. Anti-compounding brake system and valve for hydraulic cam brake actuators. 4,223,953, Cl. 303-2.000.

Cseh, Gyorgy: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Cullen, Walter P.: *See—*
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, 4,224,314, Cl. 424-122.000.

Cullis, Herbert M.: *See—*
Terman, David S.; Cullis, Herbert M.; Khoja, Mirza A.; and Sullivan, Michael R., 4,223,672, Cl. 128-214.00R.

Cutsogeorge, George A., to RCA Corporation. Stabilization of monolithic integrated circuit output levels. 4,224,536, Cl. 307-297.000.

Cymbal, William D.; and Knuth, William R., to General Motors Corporation. Electrical connector arrangement for motor vehicle steering assembly. 4,223,911, Cl. 280-731.000.

Cymny, Gerald A.: *See—*
Rochford, Robert S.; Leckonby, Robert S.; Lutwen, Ronald C.; and Cymny, Gerald A., 4,223,640, Cl. 122-1.00R.

Czegledi, Imre. Fluid metering, mixing and dispensing machine. 4,223,811, Cl. 222-136.000.

Daghe, Joseph L.: *See—*
Humes, Dennis W.; and Daghe, Joseph L., 4,223,868, Cl. 251-326.000.

Dahl, Helmut; Schottle, Ernst; Wieske, Reinhold; Weber, Alfred; and Kennecke, Mario, to Schering, Aktiengesellschaft. Novel steroids of the pregnane series, substituted in the 17-position, their manufacture and their use. 4,224,320, Cl. 424-243.000.

Dahlin, Erik B.: *See—*
Casey, Joseph M.; and Dahlin, Erik B., 4,224,513, Cl. 250-216.000.

Daido, Toshihiko: *See—*
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, 4,223,616, Cl. 112-158.00E.

Daimler-Benz Aktiengesellschaft: *See—*
Bertelsbeck, Helmut, 4,223,756, Cl. 180-169.000.

Dain, Richard J.; and Brewin, Peter R., to Powdrex Limited. Production of metal powder. 4,224,260, Cl. 264-11.000.

Daiwa Shinku Corporation: *See—*
Sasaki, Yasuo, 4,224,557, Cl. 318-116.000.

Damen, Cornelus P. T. M.: *See—*
Tijburg, Rudolf P.; and Damen, Cornelus P. T. M., 4,224,101, Cl. 156-643.000.

Dana Corporation: *See—*
Flotow, Richard A., 4,223,764, Cl. 188-72.700.
Staab, Thomas E.; and Larsen, James H., 4,223,897, Cl. 277-235.00B.

Danilov, Evgeny P.: *See—*
Dorofeev, Viktor M.; Birjukova, Evelina G.; Andzhaparidze, Otar G.; Metelkin, Oleg A.; Danilov, Evgeny P.; and Geller, Vera I., 4,224,412, Cl. 435-237.000.

Danner, William D.; and Woitschatzke, Hans, to Trak Incorporated. Ski with improved three-dimensional running surface. 4,223,909, Cl. 280-604.000.

Darnfors, Sven, to Avesta Jernverks Aktiebolag. High temperature creep resistant structural steel. 4,224,062, Cl. 75-128.00E.

Darrow, William R.; and Dunn, James M., to Carter-Wallace, Inc. Method for lowering serum uric acid. 4,224,323, Cl. 424-248.560.

Daspit, Ronald A. Releasable magnetic attachment for underwater diver's hose and the like. 4,224,653, Cl. 361-144.000.

Data Packaging Corporation: *See—*
Lowry, Alan B.; Roche, David E.; and Mathus, Gregory, 4,223,787, Cl. 206-387.000.

Date, Nobuaki: *See—*
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,223,987, Cl. 354-23.00D.

Davidson, Sam A. Electrodynamic printing system. 4,224,601, Cl. 346-150.000.

Davis, Arthur, Sr. Automobile vacuum system for inflating tires. 4,224,013, Cl. 417-404.000.

Dawson, John T.; and Whitcomb, Duane A., to Boeing Company, The. Vehicle steering apparatus. 4,223,611, Cl. 104-247.000.

De La Rue Giori S.A.: *See—*
Giori, Gualtiero, 4,224,095, Cl. 156-215.000.

de Bijl, Adrianus M. J.; and Cramwinckel, Hans, to U.S. Philips Corporation. Bus-organized computer system with independent execution control. 4,224,665, Cl. 364-200.000.

DeCraene, Denis F., to Chemetals Corporation. In-cell manganese ore reduction. 4,224,119, Cl. 204-64.00R.

Dederra, Helmut: *See—*
Kirner, Erich; and Dederra, Helmut, 4,223,530, Cl. 60-204.000.

Dekas, Socrates: *See—*
Barroero, Louis F.; and Dekas, Socrates, 4,223,482, Cl. 49-386.000.

Delafosse, Jacques, to Commissariat a l'Energie Atomique. Plate-type nuclear fuel element. 4,224,106, Cl. 176-75.000.

Delafosse, Jacques; and Feutrel, Claude, to Commissariat a l'Energie Atomique. Spacer grids for a nuclear reactor fuel assembly. 4,224,107, Cl. 176-78.000.

de Lautrec, Jacques: *See—*
Carriay, Jean; and de Lautrec, Jacques, 4,223,732, Cl. 166-291.000.

Del Cario, Adriano: *See—*
Righi, Nerio, 4,223,898, Cl. 279-1.00R.

DeLong, Harold D. Retractable wheelchair tray mechanism. 4,223,944, Cl. 297-148.000.

DeLozier, Howard K., to Rocky Mountain Foam Form, Inc. Concrete form. 4,223,501, Cl. 52-309.110.

DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., to Wisconsin Alumni Research Foundation. Fluorovitamin D compounds and processes for their preparation. 4,224,230, Cl. 260-397.200.

DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., to Wisconsin Alumni Research Foundation. Derivatives of 25-hydroxycholecalciferol. 4,224,231, Cl. 260-397.200.

DeLuca, Lawrence. Sunroof. 4,223,942, Cl. 296-222.000.

DeMatos, Henrique V.; and Piper, John, to Union Carbide Corporation. Fused electrolytic capacitor assembly. 4,224,656, Cl. 361-433.000.

Demiere, Armand, to Arcomac S.A. Web spreading roll. 4,223,426, Cl. 26-103.000.

Demoute, Jean-Pierre: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,224,227, Cl. 260-347.400.

Dempsey, Russell M.; Coker, Thomas G.; LaConti, Anthony B.; and Fragala, Anthony R., to General Electric Company. Production of halogens by electrolysis of alkali metal halides in an electrolysis cell having catalytic electrodes bonded to the surface of a solid polymer electrolyte membrane. 4,224,121, Cl. 204-98.000.

Denney, Jerry W.; and Outcalt, Mark C., to American Monitor Corporation. Assay of iron and iron binding protein reagents and methods. 4,224,034, Cl. 23-230.00B.

Dennis, Kent S.; and Raksis, Joseph W., to Dow Chemical Company, The. Combustion resistant aromatic polymers containing char-forming benzyl and/or allyl moieties. 4,224,217, Cl. 260-45.70R.

Dentsu Central Kabushiki Kaisha: *See—*
Kaneyasu, Masao, 4,223,784, Cl. 206-88.000.

Depin, Jean-Claude: *See—*
Bayssat, Michel; Sautel, Francis; Depin, Jean-Claude; and Betbeder Matibet, Annie, 4,224,341, Cl. 424-308.000.

de Salazar, Gerardo P. Bag holder. 4,223,858, Cl. 248-101.000.

deSolms, Susan J.: *See—*
Woltersdorf, Otto W., Jr.; and deSolms, Susan J., 4,224,447, Cl. 544-405.000.

de Souza, Marcos H. C.; Barbosa, Celso A.; Falleiros, Ivan G. S.; Mori, Fabio Y.; and Viertler, Werner, to Acos Villares S.A. Hard alloys. 4,224,060, Cl. 75-124.000.

Detection Systems, Inc.: *See—*
Lederer, David B., 4,224,608, Cl. 340-556.000.

Deutsch, Julius H., to Stepan Chemical Company. Sulfonated alkoxylated alkyl arylol maleate reactive surfactants. 4,224,455, Cl. 560-193.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Apparatus for producing musical tones having time variant harmonics. 4,223,583, Cl. 84-1.010.

Deutsche Babcock Aktiengesellschaft: *See—*
Noack, Rolf; Frohlich, Friedhelm; Gramelt, Stefan; and Kmoch, Gerhard, 4,224,041, Cl. 55-208.000.

Deutsche Forschungs- und Versuchsanstalt fur Luft- und Raumfahrt e.V.: *See—*
Bachmann, Volker; Nowack, Horst; and Trautmann, Karl-Heinz, 4,223,443, Cl. 33-148.00D.

Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,224,295, Cl. 423-335.000.
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,224,226, Cl. 260-347.300.

Deutschenbaur, Paul, to Hilti Aktiengesellschaft. Self-drilling dowel assembly with an annular drill bit. 4,223,587, Cl. 85-68.000.

DevChoudhury, Rathindra N., to NCR Corporation. Method and apparatus for verification of displayed characters. 4,224,614, Cl. 340-707.000.

Development Finance Corporation of New Zealand: *See—*
Ayers, John S.; Bethell, Geoffrey S.; Hancock, William S.; and Hearn, Milton T. W., 4,224,439, Cl. 536-32.000.

Devisetty, Bala N.; and Hanson, James R., to Hopkins Agricultural Chemical Co. Compatibility agents and method of use. 4,224,049, Cl. 71-86.000.

De Vries, Jochem J.: *See—*
Boiten, Ebbe; and De Vries, Jochem J., 4,223,437, Cl. 30-43.600.

Diamond Shamrock Corporation: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,224,334, Cl. 424-270.000.

DiCecio, Salvatore A., to Avmar, Incorporated. System for detecting underinflated tire in a rolling vehicle. 4,224,597, Cl. 340-58.000.

Dickson, Wilson M. Combined trailer and boat cover. 4,223,414, Cl. 9-1.500.

Didde-Glaser, Inc.: *See—*
Faddis, Terry N.; Clifton, Kenneth C.; and Sweet, Robert A., 4,223,603, Cl. 101-138.000.

Didier Engineering GmbH: *See—*
Flockenhaus, Claus, 4,224,109, Cl. 201-41.000.

Diehl: *See—*
Muller, Uno; and Stutzle, Dietmar, 4,223,607, Cl. 102-213.000.

Dieter Graesslin Feinwerktechnik: *See—*
Haas, Wolfgang; and Schonhardt, Peter, 4,224,484, Cl. 200-38.0FB.

Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., to Bayer Aktiengesellschaft. Compounds containing hydroxyl groups and urethano-aryl-sulfonic acid groups. 4,224,418, Cl. 521-170.000.

Dieterle, Walter H.: *See—*
Cauceglia, Walter B.; Dieterle, Walter H.; and Fay, Gerald B., 4,223,934, Cl. 294-15.000.

Dietmann, Karl: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 4,224,438, Cl. 536-26.000.

Dietrich, Bernhard, to Schaltbau Gesellschaft mbH. Snap action switch. 4,224,489, Cl. 200-76.000.

DiFranco, Julius V.: *See—*
Rich, Lewis C.; DiFranco, Julius V.; and Timms, Robert J., 4,224,618, Cl. 343-5.0EM.

Digital Communications Corporation: *See—*
Kaul, Pradman; Gabbard, Ova G.; Muzumdar, Deepak; and Eklof, Anders, 4,224,473, Cl. 370-84.000.

Digital Equipment Corporation: *See—*
Lewine, Donald A., 4,224,681, Cl. 364-738.000.

Dijkmans, Eise C., to U.S. Philips Corporation. Delta modulation decoder with charge quanta magnitude correction. 4,224,571, Cl. 375-28.000.

Dilmore, James A., to Westinghouse Electric Corp. Power burner for compact furnace. 4,224,019, Cl. 431-328.000.

Dishong, Lester L. Training lure for racing dogs and the like. 4,223,636, Cl. 119-29.000.

Displaytek Corporation of Sanko: *See—*
Sasaki, Yasuo, 4,224,557, Cl. 318-116.000.

DiVincenzo, Gary A., to Rorer Group, Inc. Helicopter ground handling equipment. 4,223,856, Cl. 244-50.000.

Dmitrichenko, Sergei S.: *See—*
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.

Dobkin, Robert C.; Cecil, James B.; and Connolly, Joseph J., Jr., to National Semiconductor Corporation. Statistical enhancement of the accuracy of a ratio-matched network in a circuit chip. 4,224,564, Cl. 323-74.000.

Dr.-Ing. Rudolf Hell GmbH: *See—*
Bernitt, Jurgen, 4,224,578, Cl. 330-138.000.

Dodd, Alec G.; Gale, Anthony G.; and Roberts, Derek A., to Rolls-Royce Limited. Cooled rotor blade for a gas turbine engine. 4,224,011, Cl. 416-97.00R.

Dola, Frank P.; and Nicholas, Vincent, to AMP Incorporated. Electrical wiring assembly and method. 4,223,971, Cl. 339-95.00D.

Dolan, James P., to ADS Systems, Inc. Graded particle adsorption type sensor and method of improving performance of an adsorbing sensor. 4,224,595, Cl. 338-34.000.

Dong, Julian M.: *See—*
Bilek, Paul J.; Henning, William A.; McCluhan, Thomas K.; and Dong, Julian M., 4,224,064, Cl. 75-130.00R.

Donnelly, James E., to Spin-O-Magic, Inc. Apparatus and method for lathe cutoff and chamfer. 4,223,576, Cl. 82-1.00C.

Donnelly, Thomas H.: *See—*
Kueper, Theodore V.; and Donnelly, Thomas H., 4,224,353, Cl. 426-576.000.

Donovan, John S. Ammunition belt. 4,223,590, Cl. 89-35.00R.

Dorofeev, Viktor M.; Birjukova, Evelina G.; Andzhaparidze, Otar G.; Metelkin, Oleg A.; Danilov, Evgeny P.; and Geller, Vera I. Living virus culture vaccine against canine distemper and method of preparing same. 4,224,412, Cl. 435-237.000.

Dosimeter Corporation of America: *See—*
Jackson, Thomas P.; and Fine, Laughton T., 4,224,522, Cl. 250-377.000.

Doss, Richard C., to Phillips Petroleum Company. Organo selenium and/or organo tellurium curing agent for mercaptan polymer-containing sealant. 4,224,436, Cl. 528-275.000.

Dostler, Wolfgang: *See—*
Schaller, Gotthilf; Ursel, Eckhard; Fritsch, Werner; Seibicke, Horst; and Dostler, Wolfgang, 4,223,841, Cl. 239-284.00A.

Doty, Don D.: *See—*
Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., 4,223,454, Cl. 35-25.000.

Doughty, Val J. Patient support apparatus. 4,223,862, Cl. 248-222.300.

Douglas, George H.: *See—*
Campbell, Henry F.; Santora, Norman F.; and Douglas, George H., 4,224,340, Cl. 424-304.000.

Douglas, Kent E.: *See—*
Wang, John L.; Pickus, Milton R.; and Douglas, Kent E., 4,223,434, Cl. 29-599.000.

Dover Corporation: *See—*
Wilder, Paul R.; and Wood, Chester W., 4,223,699, Cl. 137-801.000.

Dow Chemical Company, The: *See—*
Dennis, Kent S.; and Raksis, Joseph W., 4,224,217, Cl. 260-45.70R.
Levine, Charles A., 4,224,386, Cl. 429-104.000.
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,224,186, Cl. 252-429.00C.
McIntyre, James A.; and Phillips, Robert F., 4,224,129, Cl. 204-263.000.
Moreno, Carlos M.; and Bridges, Robert D., 4,224,130, Cl. 204-266.000.
Pawloski, Chester E., 4,224,318, Cl. 424-200.000.
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., 4,224,338, Cl. 424-288.000.

Dowty Meco Limited: *See—*
Barr, Thomas G., 4,223,950, Cl. 299-54.000.
Lloyd, John, 4,223,775, Cl. 192-0.094.

Dresher, Glen E.: *See—*
Dresher, Max S.; Dresher, Glen E.; and Bontkowski, Stanley E., 4,223,413, Cl. 5-282.00R.

Dresher Manufacturing Co.: *See—*
Dresher, Max S.; Dresher, Glen E.; and Bontkowski, Stanley E., 4,223,413, Cl. 5-282.00R.

Dresher, Max S.; Dresher, Glen E.; and Bontkowski, Stanley E., to Dresher Manufacturing Co. Bedstead frame assembly. 4,223,413, Cl. 5-282.00R.

Dresser Industries, Inc.: *See—*
Caswell, Richard L.; and Todd, John A., 4,223,807, Cl. 222-28.000.

Dreyer, William J.: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,224,198, Cl. 260-8.000.

Drobot, Adam T.: *See—*
Granatstein, Victor L.; Sprangle, Phillip; Drobot, Adam T.; Chu, Kwo R.; and Safter, J. Laurence, 4,224,576, Cl. 330-4.000.

Drutz, Alvin S.: *See—*
McKinnon, Eugene T.; Drutz, Alvin S.; Nelson, James B., deceased; and Nelson, Lorraine, executrix, 4,224,544, Cl. 310-90.000.

Duclos, Didier A.; and Coutin, Pierre F., to R. Alkan & Cie. Kinetic energy absorber. 4,223,763, Cl. 188-1.00C.

Dudeck, Christian: *See—*
Sauer, Wolfgang; Fliege, Werner; Dudeck, Christian; and Petri, Norbert, 4,224,254, Cl. 568-431.000.

Dudouyt, Jean-Paul. Vessel-catamaran type. 4,223,620, Cl. 114-61.000.

Duerckheimer, Walter: *See—*
Amiard, Gaston; Bormann, Dieter; Duerckheimer, Walter; and Jolly, Jean, 4,224,371, Cl. 424-246.000.

Duke University, Inc.: *See—*
Jobsis, Frans F., 4,223,680, Cl. 128-633.000.

Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, to Philip Morris Incorporated. Method for making filter cigarettes using light energy to make perforations in the filter tipping wrap. 4,224,497, Cl. 219-121.0LM.

Duley, Walter W.: *See—*
Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,498, Cl. 219-121.00L.

Dumbaugh, George D.; and Wilson, Paul A., to Vibranetics, Inc. Hopper car discharge apparatus. 4,224,006, Cl. 414-375.000.

Dumolo, David, to Fordath Limited. Foundry binders. 4,224,201, Cl. 260-18.0TN.

Dumont, Louis: *See—*
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,224,051, Cl. 71-98.000.

Duneczky, Francis: *See—*
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,224,312, Cl. 424-70.000.

Dunlop, Dean A., to Swing Stage Limited. Marine dock section. 4,223,629, Cl. 114-263.000.

Dunn, Edward C., Jr.; Hickman, Louis S.; and Penny, Thomas D., to Chase Bag Company. Bag tube-feeder system. 4,223,883, Cl. 271-11.000.

Dunn, James M.: *See—*
Darrow, William R.; and Dunn, James M., 4,224,323, Cl. 424-248.560.

Dunn, Michael W.: *See—*
Miyata, Teruo; Rubin, Albert L.; Dunn, Michael W.; and Stenzel, Kurt H., 4,223,984, Cl. 351-160.00H.

Du Pont de Nemours, E. I., and Company: *See—*
Heiberger, Philip, 4,224,202, Cl. 260-22.0CB.
Pechhold, Engelbert; and Robinson, Ivan M., 4,224,432, Cl. 528-76.000.

Dupre, George T., to NFE International, Ltd. Compact multistage particle separator. 4,224,043, Cl. 55-319.000.

Durham, Walter T.: *See—*
Barth, Gerald D.; and Durham, Walter T., 4,223,585, Cl. 85-42.000.

Dutton, Billy J.: *See—*
Wera, Glenn P.; and Dutton, Billy J., 4,223,690, Cl. 135-5.00B.

Dvorak, Charles A.; and Beard, Colin C., to Syntex (U.S.A.) Inc. Certain 1-(carbocyclic aryl)-1-halo(or mesyloxy or tosyloxy)-2-(3'-alkoxycarbonylguanidino) ethanes. 4,224,224, Cl. 260-340.50R.

Dynamit Nobel Aktiengesellschaft: *See—*
Flick, Wilhelm; Richtzenhain, Hermann; Hunger, Volker; and Joch, Wilhelm, 4,224,234, Cl. 260-448.80A.
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, 4,224,233, Cl. 556-478.000.

Dysarz, Edward D., to James G. Brown & Associates, Inc. Truss rig. 4,224,005, Cl. 405-196.000.

E. C. H. Will (GmbH & Co.): *See—*
Aykut, Kurt, 4,223,777, Cl. 198-365.000.

E-Systems, Inc.: *See—*
Mosley, William H.; Scott, Lex A.; and Gordy, Robert S., 4,224,575, Cl. 329-50.000.

Eager, Donald W., to Zemel Brothers, Inc. Snowmaking machine and method. 4,223,836, Cl. 239-2.00S.

Eastman Kodak Company: *See—*
Brenner, Barry S., 4,223,991, Cl. 354-302.000.
Burnham, Bradshaw; and Gustafson, Gary B., 4,223,884, Cl. 271-21.000.
Edwards, Evan A., 4,223,990, Cl. 354-204.000.
Glover, Clyde P.; Ferris, James E.; Meyer, Robert J.; and Muka, Edward, 4,224,032, Cl. 23-230.00B.
Vogt, Walter D., 4,223,886, Cl. 271-246.000.

Eaton Corporation: *See—*
Hastings, Jerome K., 4,224,593, Cl. 337-334.000.

Ebbers, Arnold C. Forced air heating fireplace unit. 4,223,833, Cl. 237-51.000.

Ebert, Michael: *See—*
Reick, Franklin G., 4,224,173, Cl. 252-52.00A.

Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, to Citizen Watch Co., Ltd. Data transfer circuit. 4,224,531, Cl. 307-221.00C.

Eckhardt, Wolfgang: *See—*
Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, 4,224,337, Cl. 424-279.000.

Edgar Pickering (Blackburn) Limited: *See—*
Clitheroe, Thomas, 4,223,822, Cl. 226-118.000.

Edwards, Evan A., to Eastman Kodak Company. Film and photographic apparatus. 4,223,990, Cl. 354-204.000.

Edwards, Hugh J. W., to CCL Systems Limited. Coupling assembly. 4,223,497, Cl. 52-230.000.

Edwards, Ivan J.: *See—*
Hodges, Jesse L., Jr.; and Edwards, Ivan J., 4,223,467, Cl. 43-42.310.

Edwards, Monty J.; and Voytko, James E., to Western Electric Company, Inc. Methods of and apparatus for selective plating. 4,224,117, Cl. 204-15.000.

Egami, Tetufumi: *See—*
Nagano, Masashi; Fujimoto, Hideaki; Mizuno, Toshio; and Egami, Tetufumi, 4,223,562, Cl. 474-82.000.

Ehr, Robert J.: *See—*
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., 4,224,338, Cl. 424-288.000.

Eisenberg, Morris, to Electrochimica Corporation. Electrolyte for zinc anode batteries and method of making same. 4,224,391, Cl. 429-203.000.

Eklof, Anders: *See—*
Kaul, Pradman; Gabbard, Ova G.; Muzumdar, Deepak; and Eklof, Anders, 4,224,473, Cl. 370-84.000.

El Paso Polyolefins Company: *See—*
Steinert, Robert B.; and Schuessler, William A., 4,224,282, Cl. 422-111.000.

Elbit Computers Ltd.: *See—*
Peretz, Maurice M.; and Haimovich, Yhiel, 4,224,625, Cl. 343-750.000.

Electric Power Research Institute, Inc.: *See—*
Kroon, Peter J., 4,224,491, Cl. 200-150.00R.
Rich, Joseph A., 4,224,550, Cl. 313-146.000.

Electricite de France: *See—*
Leleu, Rene O.; and Cormault, Pierre J. B., 4,224,672, Cl. 346-33.00R.

Electrochimica Corporation: *See—*
Eisenberg, Morris, 4,224,391, Cl. 429-203.000.

Electronics Stamping Corporation: *See—*
Walter, Leo, 4,223,970, Cl. 339-17.00C.

Elek, Sandor: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Elekes, Istvan: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Eli Lilly and Company: *See—*
Cooper, Robin D. G.; and Herron, David K., 4,224,442, Cl. 544-27.000.
Matsumoto, Ken, 4,224,326, Cl. 424-251.000.

Eliseenko, Albert G.: *See—*
Glodin, Jury N.; Eliseenko, Albert G.; Pshenichkin, Petr A.; Smirnov, Evgeny A.; Khavsky, Nikolai N.; and Kuznetsov, Lev B., 4,223,963, Cl. 308-188.000.

Elsner, Uwe: *See—*
Selonke, Fritz; Komossa, Werner; Elsner, Uwe; and Schlie, Gerhard, 4,223,845, Cl. 241-34.000.

Eltsov, Boris I.: *See—*
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D., 4,224,291, Cl. 423-178.000.

Emhart Industries, Inc.: *See—*
Goldstein, Sanders, 4,223,552, Cl. 73-61.10R.

Endoh, Kenjiro: *See—*
Watanabe, Hiroshi; Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,224,581, Cl. 333-14.000.

Endres, Bernhard, to J. S. Staedtler. Tubular drafting pen with improved writing point assembly. 4,224,000, Cl. 401-198.000.

Engel, Gerhard: *See—*
Wessel, Wolf; Sautter, Wilfried; Engel, Gerhard; and Stumpp, Gerhard, 4,223,654, Cl. 123-358.000.

Engelhart, John E.: *See—*
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., 4,224,338, Cl. 424-288.000.

Enomoto, Seiji: *See—*
Mogi, Jun-ichi; Miyasaka, Kiyoshi; and Enomoto, Seiji, 4,224,633, Cl. 357-23.000.

Enomoto, Shogo: *See—*
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,224,304, Cl. 424-12.000.

Entwistle, Robert J.: *See—*
Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., 4,223,454, Cl. 35-25.000.

Environmental Research Institute of Michigan: *See—*
Upatnieks, Juris, 4,223,975, Cl. 350-3.680.

Epner, Elliot J., to General Motors Corporation. Method of hole forming. 4,223,547, Cl. 72-254.000.

Erickson, Elwyn J. Pail and work stand assembly. 4,223,859, Cl. 248-154.000.

Erikson, Carl A.; Anthony, Thomas R.; Cline, Harvey E.; Ludke, Siegwalt; and Fielding, John O., to General Electric Company. Apparatus for practicing temperature gradient zone melting. 4,224,504, Cl. 219-388.000.

Ernst, Hans-Hellmut, to Autoflug GmbH. Device for rolling on and off safety belts, especially of motor vehicles. 4,223,853, Cl. 242-107.40R.

Eshelman, Philip V.; and Herman, Ronald E., to Colt Industries Operating Corp. Solenoid vacuum control valve means and apparatus and system for controlling the air-fuel ratio supplied to a combustion engine. 4,223,651, Cl. 123-438.000.

Espenscheid, Wilton F., to Mobil Oil Corporation. Asphaltic paving compositions and method of preparation from solvent refined coal. 4,224,079, Cl. 106-274.000.

Estes, John H.; and Buinicky, Ernest P., to Texaco Inc. Method for enhanced recovery of petroleum. 4,223,731, Cl. 166-272.000.

Ethyl Corporation: *See—*
Hayes, Thomas H., 4,223,842, Cl. 239-327.000.
Nelson, Gunner E., 4,224,452, Cl. 548-342.000.
Patton, John S., 4,223,793, Cl. 215-220.000.

Euteco S.p.A.: *See—*
Merli, Claudio; and Francia, Carlo, 4,224,268, Cl. 264-139.000.

Evans, David C.: *See—*
Rayner, Basil M.; and Evans, David C., 4,223,935, Cl. 294-16.000.

Evans, Edward N., to Park Mobile, Inc. Detection of properly positioned movable objects. 4,224,624, Cl. 343-112.00R.

Everts, Robert G. Flail for a rotary vegetation cutter. 4,223,441, Cl. 30-347.000.

Ewing, Michael D. Pneumatic tire having structural ribs. 4,223,713, Cl. 152-330.0RF.

Exxon Research & Engineering Co.: *See*—
Gursky, Leonard, 4,224,196, Cl. 260-3.500.
Klemann, Lawrence P.; and Stogryn, Eugene L., 4,224,256, Cl. 568-6.000.
Langer, Arthur W., Jr., 4,224,181, Cl. 252-429.00B.
Langer, Arthur W., Jr.; Steger, John J.; and Burkhardt, Terry J., 4,224,182, Cl. 252-429.00B.
Wristers, Harry J., 4,224,185, Cl. 252-429.00B.

Eyster, Charles G.; and Bissell, Holbrook C., to Time Saving Falls, Inc. Releasable locking means for closure caps. 4,223,799, Cl. 220-230.000.

Fabricant, Norman. Floating target and water projector toy. 4,223,894, Cl. 273-349.000.

Faddis, Terry N.; Clifton, Kenneth C.; and Sweet, Robert A., to Diddee-Glaser, Inc. Planetary inker for offset printing press. 4,223,603, Cl. 101-138.000.

Fahey, Robert J.; and Resnick, Martin L., to GTE Sylvania Incorporated; and GTE Laboratories Incorporated. Data transmission circuit for establishing a bidirectional data path in a telephone system. 4,224,478, Cl. 179-18.0FA.

Fake, Charles S., to Beecham Group Limited. Derivatives of 2-pyridylthiourea and pharmaceutical compositions. 4,224,331, Cl. 424-263.000.

Faldt, Inge: *See*—
Barkhuus, Per W.; and Faldt, Inge, 4,223,614, Cl. 110-238.000.

Falk, John C., to Borg-Warner Corporation. High impact blends of SAN and cross-linked polyester elastomers. 4,224,207, Cl. 260-29.20E.

Falleiros, Ivan G. S.: *See*—
de Souza, Marcos H. C.; Barbosa, Celso A.; Falleiros, Ivan G. S.; Mori, Fabio Y.; and Viertler, Werner, 4,224,060, Cl. 75-124.000.

Fattor, Arthur P., to Sun-Heet, Inc.,. Concentrating solar heat collector. 4,223,664, Cl. 126-438.000.

Fauke, Allen R.: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,224,150, Cl. 210-735.000.

Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, to Boehringer Mannheim GmbH. Adenosine-5'-carboxylic acid amides. 4,224,438, Cl. 536-26.000.

Fawcett, Harry E., to Cablecraft, Inc. Self centering device for push-pull control coaxial cables. 4,223,564, Cl. 74-501.00R.

Fay, Gerald B.: *See*—
Cauceglia, Walter B.; Dieterle, Walter H.; and Fay, Gerald B., 4,223,934, Cl. 294-15.000.

Fechter, Willi, to Gebr. Fleischmann K.G. Rail connection for electrical toy model railroads. 4,223,834, Cl. 238-10.00E.

Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., to W. R. Grace & Co. Battery separator. 4,224,393, Cl. 429-251.000.

Fekete, Ferenc; Halford, Wayne R.; and Hirtle, Michael O., to Mattel, Inc. Toy projectile launching device. 4,223,472, Cl. 46-44.000.

Feldstein, Nathan. Method for reducing the crystallinity of a stabilized colloidal composition. 4,224,178, Cl. 252-313.00R.

Felten & Guilleaume Carlswerk AG: *See*—
Piter, Hans; and Serapins, Klaus, 4,223,979, Cl. 350-96.210.

Feofanov, Lev P.: *See*—
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.

Ferranti Limited: *See*—
Powell, Brian W., 4,224,545, Cl. 310-93.000.

Ferranti-Packard Limited: *See*—
Winrow, Donald, 4,223,464, Cl. 40-449.000.

Ferris, James E.: *See*—
Glover, Clyde P.; Ferris, James E.; Meyer, Robert J.; and Muka, Edward, 4,224,032, Cl. 23-230.00B.

Feutrel, Claude: *See*—
Delafosse, Jacques; and Feutrel, Claude, 4,224,107, Cl. 176-78.000.

Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Engine efficiency meter. 4,223,553, Cl. 73-115.000.

Fiedler-Linnersund, Ulla M.; Bhatti, Khan M.; and Johansson, Gillis. Method and apparatus for detecting zinc ion activity. 4,224,114, Cl. 204-1.00T.

Fielding, John O.: *See*—
Erikson, Carl A.; Anthony, Thomas R.; Cline, Harvey E.; Ludke, Siegwalt; and Fielding, John O., 4,224,504, Cl. 219-388.000.

Fikentscher, Rolf: *See*—
Streit, Werner; Fikentscher, Rolf; Gans, Karl; Welzel, Gerhard; Glaser, Klaus; and Schaefer, Emil, 4,224,421, Cl. 525-403.000.

Filtrol Corporation: *See*—
Alafandi, Hamid; and Stamires, Dennis, 4,224,188, Cl. 252-455.00Z.

Fine, Laughton T.: *See*—
Jackson, Thomas P.; and Fine, Laughton T., 4,224,522, Cl. 250-377.000.

Fiorentzis, Michael, to BBC Brown, Boveri & Company Limited. Method and apparatus for detecting ground shorts in the rotor circuit of a generator. 4,224,652, Cl. 361-42.000.

Firetek Corporation: *See*—
Cholin, John M., 4,224,538, Cl. 307-317.00R.

Firmenich SA: *See*—
Sundt, Erling; and Ohloff, Gunther, 4,224,351, Cl. 426-535.000.

Fischer, Gerhard: *See*—
Ziegenbalg, Siegfried; Fischer, Gerhard; Haake, Gerhard; and Siebert, Rudolf, 4,224,287, Cl. 423-112.000.

Fischer, William H.; and Freeman, Willie B., to Westinghouse Electric Corp. Pneumatic operating-mechanism construction. 4,223,592, Cl. 91-189.00A.

Fisher, Forest F. R., to Ford Aerospace & Communications Corp. Microphonics elimination circuit. 4,224,521, Cl. 250-340.000.

Fishman, Aaron H., to APL Corporation. Refrigerator container. 4,223,800, Cl. 220-352.000.

Flanagan, Robert M.: *See*—
Heenan, Sidney A.; and Flanagan, Robert M., 4,224,002, Cl. 404-9.000.

Fletcher, Taylor C. Calibration system for spectrophotometers. 4,223,995, Cl. 356-418.000.

Flex-O-Lators Inc.: *See*—
Bell, George E.; and Gowing, John P., 4,223,705, Cl. 140-104.000.

Flick, Wilhelm; Richtzenhain, Hermann; Hunger, Volker; and Joch, Wilhelm, to Dynamit Nobel Aktiengesellschaft. Method for preparation of orthosilicic acid tetraalkyl esters. 4,224,234, Cl. 260-448.80A.

Fliege, Werner: *See*—
Sauer, Wolfgang; Fliege, Werner; Dudeck, Christian; and Petri, Norbert, 4,224,254, Cl. 568-431.000.

Flockenhaus, Claus, to Bergwerksverband GmbH; and Didier Engineering GmbH. Process and apparatus for the recovery of waste heat from a coke oven operation. 4,224,109, Cl. 201-41.000.

Flores, Salomon S. Molding assembly for forming winding arbors. 4,223,865, Cl. 249-144.000.

Flotow, Richard A., to Dana Corporation. Disk brake assembly. 4,223,764, Cl. 188-72.700.

Flowers, William F.: *See*—
Pardikes, Dennis G.; Flowers, William F.; Huff, Al S.; and Young, Andrew J., 4,224,156, Cl. 210-123.000.

Fluent, Stewart L.; and Foley, Dan R., to McIntosh, Arthur J. Implant gun. 4,223,674, Cl. 128-217.000.

Flynn, Richard T.: *See*—
Kindell, Jerry L.; and Flynn, Richard T., 4,224,677, Cl. 364-715.000.
Kindell, Jerry L.; and Flynn, Richard T., 4,224,682, Cl. 364-748.000.

Foerster, John E. Cotton lint cleaner. 4,223,423, Cl. 19-203.000.

Foley, Dan R.: *See*—
Fluent, Stewart L.; and Foley, Dan R., 4,223,674, Cl. 128-217.000.

Fontanes, Sylvain: *See*—
Michaud, Claude; and Fontanes, Sylvain, 4,224,605, Cl. 340-347.0AD.

Forat, Gerard: *See*—
Rivier, Georges; and Forat, Gerard, 4,224,171, Cl. 252-46.700.

Ford Aerospace & Communications Corp.: *See*—
Croissant, Carl W., Jr., 4,223,591, Cl. 89-37.50L.
Fisher, Forest F. R., 4,224,521, Cl. 250-340.000.
Peralta, Eduardo J., 4,224,512, Cl. 250-215.000.

Fordath Limited: *See*—
Dumolo, David, 4,224,201, Cl. 260-18.0TN.

Forget, Maurice: *See*—
Forget nee Lamy, Noella; and Forget, Maurice, 4,223,668, Cl. 128-66.000.

Forget nee Lamy, Noella; and Forget, Maurice. Face massager. 4,223,668, Cl. 128-66.000.

Foster, Alan I.; McCarroll, John J.; and Tennison, Stephen R., to British Petroleum Company Limited, The. Method for preparing a modified alumina catalyst support and a composition comprising said support and a catalyst. 4,224,192, Cl. 252-466.00B.

Foster, C. Mackay, Jr., to Mobil Oil Corporation. Method for shutting in a production well. 4,223,736, Cl. 166-315.000.

Foster, John W. Method for producing a geothermal reservoir in a hot dry rock formation for the recovery of geothermal energy. 4,223,729, Cl. 166-271.000.

Fournex, Robert: *See*—
Clemence, Francois; Humbert, Daniel; and Fournex, Robert, 4,224,333, Cl. 424-267.000.

Foxman, David. Adjustable attachment for a labial arch retainer. 4,224,021, Cl. 433-2.000.

Fragala, Anthony R.: *See*—
Dempsey, Russell M.; Coker, Thomas G.; LaConti, Anthony B.; and Fragala, Anthony R., 4,224,121, Cl. 204-98.000.

Fram Industrial Filter Corporation: *See*—
Jain, Kamlesh K., 4,224,157, Cl. 210-208.000.

France Ebauches: *See*—
Zangiacomi, Fernand; and Gautheret, Robert, 4,223,976, Cl. 350-96.210.

Francese, Renato: *See*—
Baldi, Luciano; Messori, Vittorio; and Francese, Renato, 4,224,444, Cl. 544-204.000.

Francia, Carlo: *See*—
Merli, Claudio; and Francia, Carlo, 4,224,268, Cl. 264-139.000.

Francis, Woodie R.: *See*—
Veronesi, Luciano; and Francis, Woodie R., 4,224,363, Cl. 417-360.000.

Franssen, Jean, to Societe Anonyme C.E.T.I.M. Automatic speed-changing system for heavyduty automotive equipment. 4,223,573, Cl. 74-858.000.

Frazier, Terry L.: *See*—
Sustek, Alvin J., Jr.; and Frazier, Terry L., 4,223,727, Cl. 166-250.000.

Freeman, Willie B.: *See*—
Fischer, William H.; and Freeman, Willie B., 4,223,592, Cl. 91-189.00A.

Fricker, Paul; Vogler, Gottfried; Knecht, Hans-Rudolf; Pierobon, Giampaolo; Schumacher, Bernd; and Zimmerman, Arnold, to A.G. fur industrielle Elektronik AGIE Losone b. Locarno. Electrical discharge machining apparatus with compound electrode movement. 4,224,495, Cl. 219-69.00V.

Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Knuth, Manfred; and Homann, Thorsten, 4,223,601, Cl. 100-117.000.

Frind, Gerhard, to General Electric Company. Fluid blast circuit breaker. 4,224,490, Cl. 200-148.00R.

Frito-Lay, Inc.: *See*—
Merck, Howard W., 4,224,350, Cl. 426-473.000.

Fritsch, Werner: *See*—
Schaller, Gotthilf; Ursel, Eckhard; Fritsch, Werner; Seibicke, Horst; and Dostler, Wolfgang, 4,223,841, Cl. 239-284.00A.

Froberg, M. Laird, to Owens-Corning Fiberglas Corporation. Electric melt furnace-electrodes inclined toward each other to vary the firing path during steady state operation and to create hot spots after heat loss or during start-up. 4,224,459, Cl. 13-6.000.

Frohlich, Friedhelm: *See*—
Noack, Rolf; Frohlich, Friedhelm; Gramelt, Stefan; and Kmoch, Gerhard, 4,224,041, Cl. 55-208.000.

Frost, Walter W.: *See*—
Mitchell, William O.; Hamilton, C. Ray; and Frost, Walter W., 4,223,815, Cl. 223-2.000.

Fry, Timothy S., to GKN Group Services Limited. Vehicle suspension. 4,223,902, Cl. 280-96.000.

Fry, Timothy S., to GKN Group Services Limited. Vehicle suspensions. 4,223,910, Cl. 280-660.000.

Fry, Timothy S., to GKN Group Services Limited. Steerable vehicles. 4,223,913, Cl. 280-771.000.

Fuchs, Adolf: *See*—
Riederer, Hans; Fuchs, Adolf; and Vial, Raymond, 4,223,719, Cl. 164-448.000.

Fuji, Akiyoshi: *See*—
Ohnishi, Keizo; Adachi, Takao; Fuji, Akiyoshi; and Chiba, Ryuichi, 4,224,360, Cl. 427-239.000.

Fuji Electric Co., Ltd.: *See*—
Takahama, Teizo; Kazama, Toyoki; and Hieda, Tatumi, 4,223,550, Cl. 73-23.000.
Takahama, Teizo; and Kazama, Toyoki, 4,224,280, Cl. 422-98.000.

Fuji Photo Film Co., Ltd.: *See*—
Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, 4,224,225, Cl. 260-346.710.
Takada, Shunji; Akimura, Yoshitaka; Mifune, Hiroyuki; and Tsujino, Nobuyuki, 4,224,401, Cl. 430-437.000.
Toda, Yuzo; Adachi, Keiichi; Ishiguro, Shoji; and Nakayama, Yasuhiro, 4,224,403, Cl. 430-537.000.

Fuji Xerox Co., Ltd.: *See*—
Takenouchi, Mutsuo; and Ozawa, Takashi, 4,224,510, Cl. 250-207.000.

Fujii, Kozo: *See*—
Nakagawa, Yunosuke; and Fujii, Kozo, 4,224,205, Cl. 260-29.60B.

Fujii, Setsuro; Watanabe, Tsuyoshi; Shiota, Masashi; Itsuo, Okumoto; and Kayama, Naohiro, to Ono Pharmaceutical Co., Ltd. Guanidinobenzoic acid compounds and process for preparing the same. 4,224,342, Cl. 424-310.000.

Fujimori, Kuniaki; Satomi, Yoshihito; Suzuka, Teruo; and Aizawa, Shirou, to Nippon Mining Co., Ltd. Process for producing cracked distillate and hydrogen from heavy oil. 4,224,140, Cl. 208-124.000.

Fujimoto, Hideaki: *See*—
Nagano, Masashi; Fujimoto, Hideaki; Mizuno, Toshio; and Egami, Tetufumi, 4,223,562, Cl. 474-82.000.

Fujimoto, Shintaro: *See*—
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.

Fujimura, Motoki: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; Watanabe, Taizo; and Fujimura, Motoki, 4,224,411, Cl. 435-177.000.

Fujino, Yoshikazu, to Kawasaki Jukogyo Kabushiki Kaisha. Multistage turbocompressor with diagonal-flow impellers. 4,224,010, Cl. 415-199.200.

Fujitsu Fanuc Limited: *See*—
Yamazaki, Etuo, 4,224,670, Cl. 364-474.000.

Fujitsu Limited: *See*—
Miura, Kenichi, 4,224,680, Cl. 364-738.000.
Mogi, Jun-ichi; Miyasaka, Kiyoshi; and Enomoto, Seiji, 4,224,633, Cl. 357-23.000.
Nishimoto, Keiji; and Tanaka, Shinpei, 4,224,089, Cl. 148-187.000.

Fujiwara, Katsuhiro: *See*—
Muramatsu, Tadao; and Fujiwara, Katsuhiro, 4,223,951, Cl. 301-37.0PB.

Fujiwara, Takeji: *See*—
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,224,115, Cl. 204-15.000.

Fujiwara, Toshihide, to Olympus Optical Co., Ltd. Automatic polarity changing device. 4,224,529, Cl. 307-127.000.

Fukuda, Masataro: *See*—
Nakamura, Kenichi; Nankai, Shiro; Iijima, Takashi; and Fukuda, Masataro, 4,224,125, Cl. 204-195.00B.

Fukunaga, Akio; and Nakane, Toshio, to Kobe Steel, Limited. Gas pressure to hydraulic pressure converter system in an oil pressure actuator. 4,223,531, Cl. 60-400.000.

Furukawa, Osamu: *See*—
Okuma, Hideo; Takahashi, Takashi; Yamashita, Yohachi; and Furukawa, Osamu, 4,224,174, Cl. 252-62.900.

Furusawa, Tomotaka: *See*—
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.

Furuya, Miyuki: *See*—
Kawano, Masatoshi; Hashimoto, Tsutomu; and Furuya, Miyuki, 4,224,542, Cl. 310-68.00E.

Futaba Denshi Kogyo K.K.: *See*—
Kamagata, Toshio; and Kishino, Takao, 4,224,616, Cl. 340-753.000.

Futagami, Mikio: *See*—
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,224,211, Cl. 260-31.20R.

Futami, Takaaki: *See*—
Takahashi, Nobuo; Uchiyama, Masanobu; Futami, Takaaki; and Imamiya, Yoji, 4,224,300, Cl. 423-416.000.

G.D. Societa per Azioni: *See*—
Winter, Berthold, 4,223,802, Cl. 221-268.000.

G.K.L. Special Tools Limited: *See*—
Skeels, Louis R., 4,223,431, Cl. 29-219.000.

G. M. Sommer Company, Inc.: *See*—
Sommer, Gordon M., 4,223,774, Cl. 192-85.0AA.

Gabbard, Ova G.: *See*—
Kaul, Pradman; Gabbard, Ova G.; Muzumdar, Deepak; and Eklof, Anders, 4,224,473, Cl. 370-84.000.

GAF Corporation: *See*—
Schneider, Louis; and Resnick, Bruce M., 4,224,245, Cl. 260-565.000.

Gaffar, Abdul; and Grecsek, John J., to Colgate-Palmolive Company. Anticalculus oral composition. 4,224,308, Cl. 424-49.000.

Gaffar, Abdul; and Grecsek, John J., to Colgate-Palmolive Company. Antibacterial oral composition. 4,224,309, Cl. 424-54.000.

Gaia, Aldino J.: *See*—
Urani, Angelo; and Gaia, Aldino J., 4,224,592, Cl. 337-198.000.

Gale, Anthony G.: *See*—
Dodd, Alec G.; Gale, Anthony G.; and Roberts, Derek A., 4,224,011, Cl. 416-97.00R.

Galkin, Pavel N.: *See*—
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.

Gallizia, Achille, to Industrie Pirelli S.p.A. Process for manufacturing closed hollow bodies in elastomeric material. 4,224,276, Cl. 264-571.000.

Gammage, Richard B.; Thorngate, John H.; and Christian, Danny J., to United States of America, Energy. Method of improving BeO as a thermoluminescent detector. 4,224,519, Cl. 250-337.000.

Gans, Karl: *See*—
Streit, Werner; Fikentscher, Rolf; Gans, Karl; Welzel, Gerhard; Glaser, Klaus; and Schaefer, Emil, 4,224,421, Cl. 525-403.000.

Garbuny, Max: *See*—
Phillips, David C.; and Garbuny, Max, 4,224,525, Cl. 250-531.000.

Garigioli, Alberto, to Whitehead Motofides SpA. Oil bath air cleaner. 4,224,042, Cl. 55-237.000.

Garner, John N., to Northern Telecom Limited. Powder filling of electric cables, with cable vibrating means. 4,224,090, Cl. 156-48.000.

Garnier, Michel C.: *See*—
Servanton, Georges; and Garnier, Michel C., 4,223,769, Cl. 192-4.00A.

Garrett Energy Research & Engineering Inc.: *See*—
Pegg, David R., 4,223,728, Cl. 166-266.000.

Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, to Baxter Travenol Laboratories, Inc. Noncritically aligned valving devices for flow rate-limiting cassettes used in intravenous solution administering equipment. 4,223,813, Cl. 222-447.000.

Garrison, Harold K., to Hesston Corporation. Foldable implement with raisable tool assembly. 4,223,743, Cl. 172-583.000.

Gateway Industries, Inc.: *See*—
Cislak, Raymond S., 4,223,618, Cl. 112-186.000.

Gatturna, Roland, to Codman & Shurtleff, Inc. Quick connect-disconnect electrofluidic junction assembly. 4,223,969, Cl. 339-15.000.

Gaughran, Wayne C.: *See*—
Alvensleben, Eric; Ryan, Jay R.; and Gaughran, Wayne C., 4,223,633, Cl. 118-203.000.

Gautheret, Robert: *See*—
Zangiacomi, Fernand; and Gautheret, Robert, 4,223,976, Cl. 350-96.210.

Gay, Walter A.: *See*—
Tobin, John H.; Gay, Walter A.; and Katz, Lawrence E., 4,224,449, Cl. 548-128.000.

Gazzarrini, Franco; Morici, Moreno; and Trapani, Vittorio, to Smiel S.p.A. Process for the purification of chlorosilanes. 4,224,040, Cl. 55-71.000.

Gebetsberger, Wilhelm: *See*—
Schulz, Walther; and Gebetsberger, Wilhelm, 4,223,730, Cl. 166-272.000.

Gebr. Fleischmann K.G.: *See*—
Fechter, Willi, 4,223,834, Cl. 238-10.00E.
Gebr. Happich GmbH: *See*—
Janz, Joachim; and Schneider, Manfred, 4,223,940, Cl. 296-37.120.
Geesen, Donald H., to PPG Industries Canada Ltd. Method of separating salts from solution. 4,224,035, Cl. 23-296.000.
Geesen, Donald H., to PPG Industries Canada Ltd. Method of concentrating salt solutions. 4,224,036, Cl. 23-296.000.
Geesen, Donald H., to PPG Industries Canada Ltd. Method for operating multiple effect evaporators. 4,224,037, Cl. 23-296.000.
Geimuplast Peter Mundt GmbH & Co. KG: *See*—
Neuhold, Arnold, 4,223,852, Cl. 242-71.100.
Geller, Vera I.: *See*—
Dorofeev, Viktor M.; Birjukova, Evelina G.; Andzhaparidze, Otar G.; Metelkin, Oleg A.; Danilov, Evgeny P.; and Geller, Vera I., 4,224,412, Cl. 435-237.000.
Gendreu, Robert, to Thomson-CSF. System for tracking a moving target with respect to a frame of reference of unvarying orientation and fixed origin relative to earth. 4,224,507, Cl. 235-412.000.
General Dynamics: *See*—
Oldendorph, Oliver F., 4,223,959, Cl. 308-15.000.
General Electric Company: *See*—
Anthony, Thomas R.; and Cline, Harvey E., 4,224,594, Cl. 338-32.00R.
Bovenkerk, Harold P.; and Gigl, Paul D., 4,224,380, Cl. 428-545.000.
Cooper, Glenn D.; and Katchman, Arthur, 4,224,209, Cl. 260-30.60R.
Dempsey, Russell M.; Coker, Thomas G.; LaConti, Anthony B.; and Fragala, Anthony R., 4,224,121, Cl. 204-98.000.
Erikson, Carl A.; Anthony, Thomas R.; Cline, Harvey E.; Ludke, Siegwalt; and Fielding, John O., 4,224,504, Cl. 219-388.000.
Frind, Gerhard, 4,224,490, Cl. 200-148.00R.
Jones, Marshall G., 4,224,499, Cl. 219-121.0LM.
Macke, Gerald F., 4,224,215, Cl. 260-37.0PC.
Parks, Harold G., 4,224,552, Cl. 313-431.000.
Quinn, Clayton B.; and Wilson, Charles A., II, 4,224,434, Cl. 528-199.000.
Schroeter, Siegfried H.; and Olson, Daniel R., 4,224,378, Cl. 428-412.000.
Shade, Russell L., Jr., 4,223,722, Cl. 165-111.000.
Simcoe, Robert J.; and Helfrich, Robert C., 4,224,530, Cl. 307-141.000.
Smith, William E., 4,224,255, Cl. 568-451.000.
Snyder, Edmund W., Jr.; and Smolenski, Alexander J., 4,224,461, Cl. 136-233.000.
Stein, Charles R., 4,224,617, Cl. 340-765.000.
Willyoung, David M., 4,223,529, Cl. 60-39.18A.
Wilson, James W. A.; and Steigerwald, Robert L., 4,224,535, Cl. 307-270.000.
General Motors Corporation: *See*—
Cymbal, William D.; and Knuth, William R., 4,223,911, Cl. 280-731.000.
Epner, Elliot J., 4,223,547, Cl. 72-254.000.
Hans, Kenneth H., 4,224,118, Cl. 204-15.000.
Harvey, Douglas J., 4,224,068, Cl. 75-206.000.
King, Jack B., 4,224,044, Cl. 55-385.00R.
Koivunen, Erkki A.; and Sherman, James F., 4,223,569, Cl. 74-665.0GE.
Pozniak, Donald J.; and Herrin, Ronald J., 4,223,648, Cl. 123-90.160.
Shea, Michael M.; and Watton, John F., 4,224,069, Cl. 75-255.000.
Gentry, Howard S.: *See*—
Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., 4,224,621, Cl. 343-5.0EM.
Geokinetics Inc.: *See*—
Lekas, Mitchell A., 4,223,734, Cl. 166-299.000.
George, Richard D.: *See*—
VanHulle, Gary L.; George, Richard D.; and Sims, William A., 4,223,943, Cl. 296-224.000.
Georgievsky, Georgy M.: *See*—
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Gernez, Alain, to Compagnie Europeenne pour l'Equipement Menager "Cepem". Device for applying voltage to a part for electrochemical treatment. 4,224,132, Cl. 204-279.000.
Gertal, Maurice. Omnidirectional vibration isolating. 4,223,762, Cl. 188-1.00B.
Gewerkschaft Eisenhutte Westfalia: *See*—
Heitkamp, Herbert, 4,224,004, Cl. 405-145.000.
Gherner, Lidio. Hydraulic motor. 4,223,594, Cl. 91-504.000.
Giambalvo, Melcheore F., to Weaver, George D.; and Weaver, Scott S., part interest to each. Contact lens cleaning and rinsing device and method. 4,223,782, Cl. 206-5.100.
Giardino, Loris: *See*—
Giardino, Vittorio; and Giardino, Loris, 4,223,484, Cl. 51-165.770.
Giardino, Vittorio; and Giardino, Loris. Electronic control device for grinding machines, based on the evaluation of truing diamond position relative to workpiece. 4,223,484, Cl. 51-165.770.
Gidaspow, Dimitri; Lee, Chang H.; and Wasan, Darsh T., to United States of America, Energy. Cross-flow electrofilter and method. 4,224,135, Cl. 204-302.000.
Gierse, Heinz. Device for the applying of melted or liquid dyes for the inking of cutting edges. 4,223,634, Cl. 118-401.000.
Gies, Helmut; and Meininger, Fritz, to Hoechst Aktiengesellschaft. Process for the reactive dyeing and printing of fibrous materials containing hydroxy groups with a water-soluble organic dyestuff containing at least one phosphonic acid-monofluoride group and at least one ionic water-solubilizing group. 4,224,024, Cl. 8-445.000.
Gigl, Paul D.: *See*—
Bovenkerk, Harold P.; and Gigl, Paul D., 4,224,380, Cl. 428-545.000.
Gijzel, Jacobus M.; and Reeder, Andries T., to U.S. Philips Corporation. Coffeemaker water heater having an arrangement for thermally removing scale deposits. 4,224,503, Cl. 219-308.000.
Gilbert, Earl F., to Westvaco Corporation. Hazardous materials container. 4,223,827, Cl. 229-15.000.
Gill, Jaswant S.; Wood, Joseph L.; and Rachima, Nissim, to Olin Corporation. Process for disposal of sulfate containing brines from diaphragm cell caustic evaporator systems. 4,223,949, Cl. 299-5.000.
Giordano, John A.: *See*—
Mahaffy, Reid A.; Psota, Joseph M.; and Giordano, John A., 4,223,513, Cl. 53-432.000.
Giori, Gualtiero, to De La Rue Giori S.A. Method of making a plate cylinder for a web printing press. 4,224,095, Cl. 156-215.000.
Giraud, Georges J. L., to Compagnie Internationale pour l'Informatique Cii-Honeywell Bull. Data processing system which protects the secrecy of confidential data. 4,224,666, Cl. 364-200.000.
Girling Limited: *See*—
Brearley, Malcolm; and White, Alfred K., 4,223,957, Cl. 303-106.000.
Margetts, Hugh G., 4,223,954, Cl. 303-6.00A.
Gitlitz, Melvin H.: *See*—
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., 4,224,338, Cl. 424-288.000.
Giurtino, Joel F.: *See*—
Goyne, Thomas E.; Herman, Stephen J.; Giurtino, Joel F.; and Anderson, Robert L., 4,223,921, Cl. 285-26.000.
GKN Group Services Limited: *See*—
Fry, Timothy S., 4,223,902, Cl. 280-96.000.
Fry, Timothy S., 4,223,910, Cl. 280-660.000.
Fry, Timothy S., 4,223,913, Cl. 280-771.000.
Glanvall, Rune V., to Stal Refrigeration AB. Rotary compressor with liquid injection. 4,224,014, Cl. 418-76.000.
Glaser, Klaus: *See*—
Streit, Werner; Fikentscher, Rolf; Gans, Karl; Welzel, Gerhard; Glaser, Klaus; and Schaefer, Emil, 4,224,421, Cl. 525-403.000.
Glass Containers Corporation: *See*—
Ali-Zaidi, Syed R., 4,224,365, Cl. 428-35.000.
Glaus, Heinrich, to Strapex AG. Method and apparatus for attaching a metallic connection element at a support, especially for connecting the over-lapping sections of a packaging band or the like. 4,223,704, Cl. 140-93.400.
Glazer, Marvin A., to Motorola, Inc. Modified semiconductor temperature sensor. 4,224,537, Cl. 307-310.000.
Gleeson, Maurice J.: *See*—
Blair, John T.; and Gleeson, Maurice J., 4,223,506, Cl. 52-644.000.
Glenn, William E., to New York Institute of Technology. Variable delay system. 4,223,560, Cl. 73-626.000.
Glockler, Otto; Herth, Harro; Wilfert, Thomas; and Kraus, Bernd, to Robert Bosch GmbH. Method and apparatus for fuel mixture enrichment during acceleration. 4,223,643, Cl. 123-492.000.
Glodin, Jury N.; Eliseenko, Albert G.; Pshenichkin, Petr A.; Smirnov, Evgeny A.; Khavsky, Nikolai N.; and Kuznetsov, Lev B. Antifriction bearing, method of making same and antifriction material for performing this method. 4,223,963, Cl. 308-188.000.
Glover, Clarence J., to Surratt Hosiery Mill, Inc. Hosiery cuff forming apparatus. 4,223,816, Cl. 223-37.000.
Glover, Clyde P.; Ferris, James E.; Meyer, Robert J.; and Muka, Edward, to Eastman Kodak Company. Method and apparatus for chemical analysis. 4,224,032, Cl. 23-230.00B.
Goeke, Alfons; Hartkopf, Heinz; Tuckmantel, Eberhand; and Schweer, Wilhelm, to Th. Kieserling & Albrecht. Apparatus and method for internally peeling pipes. 4,223,578, Cl. 82-1.00C.
Goldhaber, Richard P.; Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., to Baxter Travenol Laboratories, Inc. Dialyzer connector system with snap-lock button-type connector and O-ring. 4,224,163, Cl. 210-321.00B.
Goldstein, Sanders, to Emhart Industries, Inc. Apparatus and method for sensing a substance on a liquid surface. 4,223,552, Cl. 73-61.10R.
Goldthorp, David C.; and Tuhy, Frank P., Jr., to Bell Telephone Laboratories, Incorporated. Relay driver circuit. 4,224,654, Cl. 361-152.000.
Gomez, Magdalena U.; and Wicks, Richard W., to Hoffmann-La Roche Inc. Immunochemical LDH_1 assay. 4,224,406, Cl. 435-7.000.
Gonsalves, Almiro. Mechanic's lifting device. 4,223,932, Cl. 294-1.00R.
Gooch, Robert C.; and Guenther, John J. Meat tenderizing method. 4,224,349, Cl. 426-281.000.
Good, David M., to Tapecon, Inc. Recording tape carrier. 4,223,463, Cl. 40-158.00R.
Goodland, John L. Carpentry measuring tool. 4,223,445, Cl. 33-194.000.
Gorchev, Dimiter; Rodgers, Thomas P.; and Willke, Herbert L., Jr., to Mitco Corporation. Damper for an air distribution system. 4,223,832, Cl. 236-49.000.
Gordon, Gary B., to Hewlett-Packard Company. Tri-state signal conditioning method and circuit. 4,224,534, Cl. 307-261.000.

Gordy, Robert S.: *See—*
Mosley, William H.; Scott, Lex A.; and Gordy, Robert S., 4,224,575, Cl. 329-50.000.

Gotaverken Aluminium AB: *See—*
Potter, Timothy K.; and Lopez Gomez, Raimundo, 4,223,504, Cl. 52-479.000.

Gotaverken Oresundsvarvet AB: *See—*
Barkhuus, Per W.; and Faldt, Inge, 4,223,614, Cl. 110-238.000.

Gowing, John P.: *See—*
Bell, George E.; and Gowing, John P., 4,223,705, Cl. 140-104.000.

Goyne, Thomas E.; Herman, Stephen J.; Giurtino, Joel F.; and Anderson, Robert L., to Cobe Laboratories, Inc. Mount for supporting a medical device. 4,223,921, Cl. 285-26.000.

Gozzo, Franco: *See—*
Colle, Roberto; Gozzo, Franco; Camaggi, Giovanni; and Siddi, Giorgio, 4,224,050, Cl. 71-98.000.

Grabb, Frederick G.; and Roberts, James K., to Bendix Corporation, The. Integral suspension member. 4,223,903, Cl. 280-96.100.

Gramelt, Stefan: *See—*
Noack, Rolf; Frohlich, Friedhelm; Gramelt, Stefan; and Kmoch, Gerhard, 4,224,041, Cl. 55-208.000.

Granatstein, Victor L.; Sprangle, Phillip; Drobot, Adam T.; Chu, Kwo R.; and Safter, J. Laurence, to United States of America, Navy. Gyrotron travelling-wave amplifier. 4,224,576, Cl. 330-4.000.

Grandi, Attilio, to Termomeccanica Italiana S.p.A. Submersible pump with improved sealing means. 4,224,009, Cl. 415-168.000.

Grapes, Eugene F.: *See—*
Patterson, William W., III; and Grapes, Eugene F., 4,223,869, Cl. 24-68.0CD.

Gratza, Peter, to Bayerische Motoren Werke Aktiengesellschaft. Installation for lowering a kickstand arranged on a motorcycle. 4,223,906, Cl. 280-301.000.

Gray, Stanley, to Mechanical Technology Incorporated. Modular compliant hydrodynamic bearing with overlapping bearing sheet. 4,223,958, Cl. 308-9.000.

Grecsek, John J.: *See—*
Gaffar, Abdul; and Grecsek, John J., 4,224,308, Cl. 424-49.000.
Gaffar, Abdul; and Grecsek, John J., 4,224,309, Cl. 424-54.000.

Greenberg, Sheldon, to Shelcore, Inc. Aquarium crib toy. 4,223,471, Cl. 46-41.000.

Greene, Richard F.; and Scharnhorst, Kurt P., to United States of America, Navy. Room temperature two color infrared detector. 4,224,520, Cl. 250-338.000.

Greene, Robin R. Game for swimming pools. 4,223,888, Cl. 272-103.000.

Greenlees, James C. Writing guide for clipboard or the like. 4,223,447, Cl. 33-443.000.

Gregg, Earle C.: *See—*
Bakale, George; and Gregg, Earle C., 4,224,566, Cl. 324-71.00R.

Greiner, Harry: *See—*
Kaiser, Werner; and Greiner, Harry, 4,224,613, Cl. 340-679.000.

Greve, Heinz; and Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Apparatus for ascertaining the resistance of cigarettes or the like to axial flow of gases therethrough. 4,223,551, Cl. 73-38.000.

Grey, Roger A.; and Pez, Guido P., to Allied Chemical Corporation. Process for homogeneous hydrogenation of polycyclic aromatic hydrocarbons. 4,224,458, Cl. 585-266.000.

Griffiths, David W.: *See—*
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,224,150, Cl. 210-735.000.

Grimm, Eberhard: *See—*
Husges, Gerd; Schuller, Edmund; Karl, Rupert; and Grimm, Eberhard, 4,223,517, Cl. 57-261.000.

Griner, Paul, to Wagner Electric Corporation. Frequency to digital converter. 4,224,568, Cl. 324-78.00D.

Grisgraber, Edwin G.: *See—*
Coppola, Vincent G.; Grisgraber, Edwin G.; and Lorenzo, John L., 4,224,506, Cl. 235-92.0FP.

Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, to Philip Morris Incorporated. Apparatus for perforating articles by laser. 4,224,498, Cl. 219-121.00L.

Grymes, John R., Jr.: *See—*
Bean, Donald E.; Grymes, John R., Jr.; and Maine, Reuben E., 4,224,619, Cl. 343-5.0EM.

GTE Laboratories Incorporated: *See—*
Fahey, Robert J.; and Resnick, Martin L., 4,224,478, Cl. 179-18.0FA.

GTE Sylvania Incorporated: *See—*
Anderson, Richard W.; and Bottner, Alfred I., 4,224,602, Cl. 340-321.000.
Fahey, Robert J.; and Resnick, Martin L., 4,224,478, Cl. 179-18.0FA.

Gubbiotti, Lino, to Brevetti Umbria S.r.l. Dosed delivery device for liquids, particularly for delivering water to vegetal cultivations. 4,223,837, Cl. 239-50.000.

Guenther, John J.: *See—*
Gooch, Robert C.; and Guenther, John J., 4,224,349, Cl. 426-281.000.

Gueremy, Claude G. A.; Hodac, Francoise; and Renault, Christian L. A., to Pharmindustrie. 1-Aza-[2,2,2]-bicyclooctanes and anti-depressant and anti-parkinsonian compositions thereof. 4,224,332, Cl. 424-267.000.

Guerrero, Benjamin G., to Mattel, Inc. Motion translating mechanism. 4,223,561, Cl. 74-105.000.

Gueuret, Francois C.: *See—*
Boutet, Jean-Pierre L.; and Gueuret, Francois C., 4,223,738, Cl. 166-368.000.

Guggemos, Arthur R.: *See—*
Guggemos, Kenneth F.; and Guggemos, Arthur R., 4,223,861, Cl. 248-222.300.

Guggemos, Kenneth F.; and Guggemos, Arthur R., to Sterner Lighting Systems Incorporated. Adjustable hanger for elongated wall mounted members. 4,223,861, Cl. 248-222.300.

Guilloteau, Joel: *See—*
Reboux, Jean; and Guilloteau, Joel, 4,224,494, Cl. 219-9.500.

Gulf Research & Development Company: *See—*
Onopchenko, Anatoli; and Schulz, Johann G. D., 4,224,232, Cl. 260-413.000.

Gunderlock, Richard: *See—*
Jaeger, Arthur; Gunderlock, Richard; and Harwood, Richard J., 4,223,788, Cl. 206-468.000.

Gupta, Amitava: *See—*
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, 4,224,359, Cl. 427-221.000.

Gursky, Leonard, to Exxon Research & Engineering Co. Flex resistant sidewall compounds. 4,224,196, Cl. 260-3.500.

Gustafson, Gary B.: *See—*
Burnham, Bradshaw; and Gustafson, Gary B., 4,223,884, Cl. 271-21.000.

Gustafson Mfg. Co.: *See—*
Olander, Harvey F., 4,223,757, Cl. 180-273.000.

Guthikonda, Ravindra N.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,224,336, Cl. 424-274.000.

H. H. Robertson Company: *See—*
Hague, James G., 4,223,503, Cl. 52-478.000.

Haake, Gerhard: *See—*
Ziegenbalg, Siegfried; Fischer, Gerhard; Haake, Gerhard; and Siebert, Rudolf, 4,224,287, Cl. 423-112.000.

Haarmann, Walter: *See—*
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,224,322, Cl. 424-246.000.

Haas, Wolfgang; and Schonhardt, Peter, to Dieter Graesslin Feinwerktechnik. Time switching device. 4,224,484, Cl. 200-38.0FB.

Haber, Conrad H.: *See—*
Nossen, Edward J.; and Haber, Conrad H., 4,224,679, Cl. 364-728.000.

Haber, Raphael R. G.; and Schoenberger, Eva. 2'-(5'-Nitrofuryl) substituted quinolines. 4,224,448, Cl. 546-167.000.

Haentjens, Walter D. Volute slurry pump and throttle bushing therefor. 4,224,008, Cl. 415-112.000.

Haering, Rudolph R.; Stiles, James A. R.; and Brandt, Klaus. Lithium molybdenum disulphide battery cathode. 4,224,390, Cl. 429-194.000.

Hagemeyer, Gunter: *See—*
Upmeier, Egon; and Hagemeyer, Gunter, 4,223,617, Cl. 112-184.000.

Hague, James G., to H. H. Robertson Company. Joint for building panels. 4,223,503, Cl. 52-478.000.

Haimovich, Yhiel: *See—*
Peretz, Maurice M.; and Haimovich, Yhiel, 4,224,625, Cl. 343-750.000.

Hajek, Manfred; Wagner, Kuno; Moller, Friedrich; and Vehlewald, Peter, to Bayer Aktiengesellschaft. High molecular weight polyamines and their use in preparation of polyurethane resins. 4,224,417, Cl. 521-166.000.

Hajime Industries, Ltd.: *See—*
Yoshida, Hajime, 4,223,790, Cl. 209-590.000.

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Mee, John M. L.; Halpern, Berthold; and Korth, John, 4,224,031, Cl. 23-230.00B.

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Mizutani, Norio; and Hamanishi, Yoshinari, 4,223,981, Cl. 350-184.000.

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Hamley, James P., to Motorola, Inc. High energy spark ignition system. 4,223,656, Cl. 123-598.000.

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Handte, Herbert, to Moog GmbH. Method and apparatus for regulating the speed of a conveyor. 4,224,561, Cl. 318-663.000.

Hans, Kenneth H., to General Motors Corporation. Method of masking plated article with a poly(isobutyl methacrylate) and poly(vinyl toluene) containing coating. 4,224,118, Cl. 204-15.000.

Hansen, Elo H.; and Ruzicka, Jaromir, to Bifok A.B. Programmable, continuous flow analyzer. 4,224,033, Cl. 23-230.00R.

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Hanson, James R.: *See*—
Devisetty, Bala N.; and Hanson, James R., 4,224,049, Cl. 71-86.000.
Hanstein, Friedrich: *See*—
Moench, Theodor P.; and Hanstein, Friedrich, 4,223,493, Cl. 52-200.000.
Hardy, Herbert L., to Polaroid Corporation. Regulator circuit for photographic illumination. 4,224,563, Cl. 323-225.00C.
Hardy, John L.: *See*—
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., 4,224,338, Cl. 424-288.000.
Hardy, William B.: *See*—
Roberts, Rex D.; and Hardy, William B., 4,224,451, Cl. 548-260.000.
Hare, Donald S. T-Shirt coloring kit. 4,224,358, Cl. 427-147.000.
Hare, Wilbert K., to American Home Products Corporation. Baking pan and method of forming same. 4,223,619, Cl. 113-120.00G.
Hargis, Billy M., to Minnesota Mining and Manufacturing Company. Leaded mounting and connector unit for an electronic device. 4,224,637, Cl. 357-74.000.
Harlow, John M. Plaque displaying devices. 4,223,864, Cl. 248-490.000.
Harris Corporation: *See*—
Stanton, Arthur J.; Raney, Meredith T.; and Parker, Ralph L., 4,223,994, Cl. 355-28.000.
Harris, William J. Device for puckering the flesh to assist in injections. 4,223,673, Cl. 128-215.000.
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Persons, Charles, II; and Harst, Robb, 4,223,905, Cl. 280-289.00R.
Hartkopf, Heinz: *See*—
Goeke, Alfons; Hartkopf, Heinz; Tuckmantel, Eberhand; and Schweer, Wilhelm, 4,223,578, Cl. 82-1.00C.
Hartzell, Robert A., to Litton Systems, Inc. Method and apparatus for making crystals. 4,224,100, Cl. 156-617.00M.
Harvey, Douglas J., to General Motors Corporation. Method of making distributor rotor electrode containing dielectric bodies for suppressing radio frequency interference. 4,224,068, Cl. 75-206.000.
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Jaeger, Arthur; Gunderlock, Richard; and Harwood, Richard J., 4,223,788, Cl. 206-468.000.
Hashimoto, Tsutomu: *See*—
Kawano, Masatoshi; Hashimoto, Tsutomu; and Furuya, Miyuki, 4,224,542, Cl. 310-68.00E.
Hastings, Jerome K., to Eaton Corporation. Double-motion thermostat. 4,224,593, Cl. 337-334.000.
Hatch, Burton D., to United States of America, Navy. Purification of liquid metal current collectors. 4,224,546, Cl. 310-178.000.
Haugen, Haakon, to Texaco Inc. Rust inhibiting additive compositions for oils. 4,224,170, Cl. 252-32.70E.
Hauni-Werke Korber & Co., KG: *See*—
Greve, Heinz; and Wahle, Gunter, 4,223,551, Cl. 73-38.000.
Selonke, Fritz; Komossa, Werner; Elsner, Uwe; and Schlie, Gerhard, 4,223,845, Cl. 241-34.000.
Hauser, Hans: *See*—
Violet, Jon A.; and Hauser, Hans, 4,223,997, Cl. 366-47.000.
Hayamizu, Yoshisada, to Olympus Optical Co., Ltd. Focusing optical system for single-lens reflex cameras. 4,223,989, Cl. 354-59.000.
Hayashi, Kenji; Washizawa, Mitsuo; and Yokoo, Shuji, to Kyowa Hakko Kogyo Kabushiki Kaisha. Process for improving the properties of gelatin. 4,224,348, Cl. 426-234.000.
Hayashi, Mikio: *See*—
Aoyagi, Masaya; Hayashi, Mikio; Yoshida, Yasuyuki; and Yao, Yoshiaki, 4,223,412, Cl. 3-1.900.
Haydn, Josef: *See*—
Birkenstock, Udo; and Haydn, Josef, 4,224,248, Cl. 260-580.000.
Hayes, Thomas H., to Ethyl Corporation. Squeeze bottle atomizer. 4,223,842, Cl. 239-327.000.
Hays, Wilbur L., to United States of America, Air Force. Selectable servo ratio and dual speed control system for large centrifuge units. 4,224,558, Cl. 318-314.000.
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Takeda, Susumu; Hazama, Kiyoaki; and Ichitsuka, Nobuo, 4,223,992, Cl. 354-266.000.
Hazenveld, Martin G. Garment hanger. 4,223,817, Cl. 223-94.000.
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Ayers, John S.; Bethell, Geoffrey S.; Hancock, William S.; and Hearn, Milton T. W., 4,224,439, Cl. 536-32.000.
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Heckler, Manfred: *See*—
Jaquet, Jean-Claude; Heckler, Manfred; and Zoller, Heinrich, 4,224,065, Cl. 75-139.000.
Heenan, Sidney A.; and Flanagan, Robert M., to Amerace Corporation. Highway delineator. 4,224,002, Cl. 404-9.000.
Heiber, Sonia J.: *See*—
Mueller, Karl F.; Heiber, Sonia J.; and Plankl, Walter L., 4,224,427, Cl. 526-93.000.
Heiberger, Philip, to Du Pont de Nemours, E. I., and Company. Alkydmonomer high-solids coating composition. 4,224,202, Cl. 260-22.0CB.
Heinemann, Frederick E., to W. R. Grace & Co. Transverse stiffened screen printing blanket. 4,224,370, Cl. 428-246.000.
Heinz, George G. Exotic leather, method of processing same, and method of processing domestic fowl. 4,224,029, Cl. 8-94.19R.
Heinzl, Joachim, to Siemens Aktiengesellschaft. Piezo-electric actuating element for recording heads. 4,223,998, Cl. 400-126.000.
Heiss, Herbert L., to Mobay Chemical Corporation. Heterocyclic nylon-1 type polymers. 4,224,431, Cl. 528-48.000.
Heitkamp, Herbert, to Gewerkschaft Eisenhutte Westfalia. Knife shield. 4,224,004, Cl. 405-145.000.
Helfrich, Robert C.: *See*—
Simcoe, Robert J.; and Helfrich, Robert C., 4,224,530, Cl. 307-141.000.
Helix Technology Corporation: *See*—
Traut, Donald P., 4,224,147, Cl. 210-660.000.
Hellwig, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Gas discharge indicator device. 4,224,553, Cl. 313-489.000.
Henning, William A.: *See*—
Bilek, Paul J.; Henning, William A.; McCluhan, Thomas K.; and Dong, Julian M., 4,224,064, Cl. 75-130.00R.
Henrick, Clive A.; Labovitz, Jeffrey N.; Leippe, Michael M.; and Woo, Sam L., to Zoecon Corporation. Esters and thiolesters of benzothienyl acids. 4,224,330, Cl. 424-263.000.
Hensley, Albert L., Jr.; Quick, Leonard M.; and Hopkins, P. Donald, to Standard Oil Company (Indiana). Hydrotreating a hydrocarbon stream to remove nitrogen and sulfur. 4,224,144, Cl. 208-216.0PP.
Henson, Paul D.: *See*—
Benner, Roland G.; and Henson, Paul D., 4,224,247, Cl. 260-575.000.
Herbert, Sumter. Exhaust gas recycling system. 4,223,650, Cl. 123-568.000.
Herbertz, Toni: *See*—
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,224,269, Cl. 264-171.000.
Herman, Ronald E.: *See*—
Eshelman, Philip V.; and Herman, Ronald E., 4,223,651, Cl. 123-438.000.
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Herron, David K.: *See*—
Cooper, Robin D. G.; and Herron, David K., 4,224,442, Cl. 544-27.000.
Hertel, Hasso; and Trampusch, Adolf, to Hoechst Aktiengesellschaft. Process for the production of water-insoluble azo dyestuffs on the fiber with polyphosphate. 4,224,027, Cl. 8-666.000.
Herth, Harro: *See*—
Glockler, Otto; Herth, Harro; Wilfert, Thomas; and Kraus, Bernd, 4,223,643, Cl. 123-492.000.
Hesston Corporation: *See*—
Garrison, Harold K., 4,223,743, Cl. 172-583.000.
Hewlett-Packard Company: *See*—
Gordon, Gary B., 4,224,534, Cl. 307-261.000.
Sherman, Allan P., 4,223,681, Cl. 128-672.000.
Sherman, Allan P., 4,223,682, Cl. 128-672.000.
Heyneman, Guido: *See*—
Thieme, Roland; and Heyneman, Guido, 4,224,281, Cl. 422-100.000.
Hickman, Louis S.: *See*—
Dunn, Edward C., Jr.; Hickman, Louis S.; and Penny, Thomas D., 4,223,883, Cl. 271-11.000.
Hickman, Ronald P., to Inventec International Limited. Workbenches. 4,223,881, Cl. 269-139.000.
Hieda, Tatumi: *See*—
Takahama, Teizo; Kazama, Toyoki; and Hieda, Tatumi, 4,223,550, Cl. 73-23.000.
Higute, Michinosuke; and Yoshikai, Tatsuki, to Nippon Kokan Kabushiki Kaisha. Apparatus for pushing a barge with a push boat. 4,223,628, Cl. 114-246.000.
Hijikata, Kazuo, to Olympus Optical Co., Ltd. Method and apparatus for determining the rate of enzyme reaction. 4,224,405, Cl. 435-3.000.
Hilal, Mohamed A., to Wisconsin Alumni Research Foundation. Heat transfer in boiling liquified gas. 4,223,723, Cl. 165-133.000.
Hill, James C., to Lach Fluid Power, Inc. Hydraulic expansion joint. 4,223,923, Cl. 285-95.000.
Hill, Kerry; and Butterworth, Edward, to British Steel Corporation. Distance measurement. 4,223,442, Cl. 33-126.70A.
Hills, Isaac. Marionette with strings with different degrees of elasticity. 4,223,475, Cl. 46-126.000.
Hilti Aktiengesellschaft: *See*—
Deutschenbaur, Paul, 4,223,587, Cl. 85-68.000.
Hiniker Company: *See*—
Bush, Vincent N.; and Hiniker, Thomas K., 4,224,466, Cl. 178-69.00G.
Hiniker, Thomas K.: *See*—
Bush, Vincent N.; and Hiniker, Thomas K., 4,224,466, Cl. 178-69.00G.
Hirai, Toshio; and Niihara, Koichi, to Research Institute for Iron, Steel and Other Metals of the Tohoku University, The. Super hard-highly pure silicon nitrides, and a process and apparatus for producing the same. 4,224,296, Cl. 423-344.000.
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, to Kubota Ltd. High corrosion resistant and high strength medium Cr and low Ni stainless cast steel. 4,224,061, Cl. 75-125.000.
Hirano, Satoshi: *See*—
Kawasaki, Yoshimi; Imaseki, Izumi; Hirano, Satoshi; Amano, Katsuhiko; and Shigematsu, Masatsune, 4,224,195, Cl. 252-546.000.
Hirtle, Michael O.: *See*—
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Hisatomi, Junichirou: *See*—
Kawamura, Koichi; Honda, Junichi; Hisatomi, Junichirou; and Shigemasa, Junichiro, 4,224,081, Cl. 136-251.000.
Hitachi Chemical Company, Ltd.: *See*—
Maekawa, Iwao; Uchigasaki, Isao; Takamizawa, Shouzi; and Kageyama, Akira, 4,224,430, Cl. 526-282.000.
Hitachi, Ltd.: *See*—
Kohyama, Masaharu; Ishibashi, Tadashi; and Watanabe, Rokuro, 4,224,093, Cl. 156-99.000.
Hodac, Francoise: *See*—
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Hodge, Edward B., to International Minerals and Chemical Corporation. Process for the synthesis and separation of the threo and erythro isomers of 2-amino-1-phenyl-1-propanol. 4,224,246, Cl. 260-570.600.
Hodges, Jesse L., Jr.; and Edwards, Ivan J. Vibrating fishing lure. 4,223,467, Cl. 43-42.310.
Hoechst Aktiengesellschaft: *See*—
Gies, Helmut; and Meininger, Fritz, 4,224,024, Cl. 8-445.000.
Hertel, Hasso; and Trampusch, Adolf, 4,224,027, Cl. 8-666.000.
Neumaier, Hubert, 4,224,241, Cl. 260-543.00P.
Reinhardt, Friedrich, 4,224,026, Cl. 8-532.000.
Spietschka, Ernst; Schiessler, Siegfried; and Tronich, Wolfgang, 4,224,222, Cl. 260-314.500.
Wiedemann, Wolfgang, 4,224,395, Cl. 430-59.000.
Wunder, Friedrich; Arpe, Hans-Jurgen; Leupold, Ernst I.; and Schmidt, Hans-Joachim, 4,224,236, Cl. 260-449.00R.
Hoefer, Peter S.; and Whitesides, Michael, to Hoefer Scientific Instruments. Vertical gel slab electrophoresis apparatus and method therefor. 4,224,134, Cl. 204-299.00R.
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Hoefer, Peter S.; and Whitesides, Michael, 4,224,134, Cl. 204-299.00R.
Hoffman, Charles R.: *See*—
Conner, David E.; Hoffman, Charles R.; and Laakso, Melvin T., 4,224,684, Cl. 364-900.000.
Hoffman, Robert A., to United States of America, Energy. Apparatus for measuring resistance change only in a cell analyzer and method for calibrating it. 4,224,567, Cl. 324-71.0CP.
Hoffmann-La Roche Inc.: *See*—
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,224,244, Cl. 260-562.00R.
Gomez, Magdalena U.; and Wicks, Richard W., 4,224,406, Cl. 435-7.000.
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,224,445, Cl. 544-212.000.
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Hogen Esch, Johannes H. L., to Vitatron Scientific B.V. Apparatus for performing tests and measurements on liquid samples. 4,224,278, Cl. 422-65.000.
Holloway, Jack W., to United States of America, Navy. Method and apparatus for securing a ferroelectric stack to a weighted projection surface. 4,223,428, Cl. 29-25.350.
Holtz, Gilbert J. Exercise supervision device. 4,223,887, Cl. 272-70.000.
Holvoet, Gerard; and Nicolas, Michel, to Orega Circuits et Communication. Electric relay having multiple operational thresholds. 4,224,588, Cl. 335-152.000.
Homann, Thorsten: *See*—
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Honda Giken Kogyo Kabushiki Kaisha: *See*—
Ishige, Yoshiki; Kinugasa, Toshiyuki; Ando, Yoshio; and Sato, Shoji, 4,224,376, Cl. 428-315.000.
Mizuno, Hiroshi; and Kobayashi, Seiichiro, 4,223,754, Cl. 180-90.000.
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Sugiyama, Tomoyuki; Machida, Shigeru; Kubo, Akihiro; Araki, Junichi; and Nakamura, Nobuyuki, 4,223,565, Cl. 74-574.000.
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Bartles, James I., 4,224,606, Cl. 340-514.000.
Honeywell Information Systems Inc.: *See*—
Kindell, Jerry L.; and Flynn, Richard T., 4,224,677, Cl. 364-715.000.
Kindell, Jerry L.; and Flynn, Richard T., 4,224,682, Cl. 364-748.000.
Peters, Arthur; and Negi, Virendra S., 4,224,668, Cl. 364-200.000.
Trinchieri, Mario G., 4,224,664, Cl. 364-200.000.
Honma, Takaji; Tanaka, Motoaki; Yamada, Syozo; and Miyake, Hidekazu, to Taiho Pharmaceutical Company. Process for the preparation of glyoxal-2-oximes. 4,224,450, Cl. 548-248.000.
Honsel, Karl-Heinz. Apparatus for converting blanks into envelopes. 4,223,596, Cl. 93-62.000.
Hood, Norman L., to Lucas Industries Limited. Wiper mechanisms. 4,224,492, Cl. 200-153.00L.
Hopkins Agricultural Chemical Co.: *See*—
Devisetty, Bala N.; and Hanson, James R., 4,224,049, Cl. 71-86.000.
Hopkins, P. Donald: *See*—
Hensley, Albert L., Jr.; Quick, Leonard M.; and Hopkins, P. Donald, 4,224,144, Cl. 208-216.0PP.
Hopkins, Ronald C., to Life Savers, Inc. Automatic transfer mechanism. 4,223,779, Cl. 198-426.000.
Hori, Yoshio, to Matsuo Electric Company, Limited. Series of electronic components. 4,223,786, Cl. 206-330.000.
Horie, Shigeru: *See*—
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
Houdart, Michel, to Thomson-CSF. Directional microwave coupler. 4,224,584, Cl. 333-116.000.
Hovens, Paulus J. M.; Tryzna, Miloslav; Smeulers, Wouter; and Amsen, Willem H., to U.S. Philips Corporation. CRT Beam current control apparatus. 4,224,640, Cl. 358-242.000.
Hoverlift Systems Ltd.: *See*—
Hunt, Rowland D., 4,223,755, Cl. 180-123.000.
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Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, to Hoffmann-La Roche Inc. Thienothiazine derivatives. 4,224,445, Cl. 544-212.000.
Huang, Liang H.: *See*—
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, 4,224,314, Cl. 424-122.000.
Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, to Ciba-Geigy Corporation. Pesticidal compositions. 4,224,337, Cl. 424-279.000.
Huetsch, Larry C.; Swanson, James P.; and Nyquist, Stephen E., to Atwood Vacuum Machine Company. Trailer hitch and brake actuating assembly. 4,223,766, Cl. 188-112.00R.
Huff, Al S.: *See*—
Pardikes, Dennis G.; Flowers, William F.; Huff, Al S.; and Young, Andrew J., 4,224,156, Cl. 210-123.000.
Hug, William F.: *See*—
Marlett, Calvin J.; Reed, Edwin A.; Johnson, Richard C.; and Hug, William F., 4,224,579, Cl. 331-94.50G.
Humbert, Daniel: *See*—
Clemence, Francois; Humbert, Daniel; and Fournex, Robert, 4,224,333, Cl. 424-267.000.
Humes, Dennis W.; and Daghe, Joseph L., to Mueller Co. Resilient seated gate valve. 4,223,868, Cl. 251-326.000.
Hung, Paul P.; and Lee, Shaw-guang, to Abbott Laboratories. Deoxyribonucleic acid synthesis using binding protein. 4,224,408, Cl. 435-91.000.
Hunger, Volker: *See*—
Flick, Wilhelm; Richtzenhain, Hermann; Hunger, Volker; and Joch, Wilhelm, 4,224,234, Cl. 260-448.80A.
Hunt, Bettie W. Ornamental display container. 4,224,364, Cl. 428-11.000.
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., to Lever Brothers Company. Manufacture of detergent bars. 4,224,266, Cl. 264-75.000.
Hunt, Rowland D., to Hoverlift Systems Ltd. Suppressing ejection of water and other surface material from air cushion vehicles. 4,223,755, Cl. 180-123.000.
Hurley, Donald L.: *See*—
Laven, Thomas R.; Hurley, Donald L.; Bange, Joseph B.; and Wessel, Francis H., 4,224,165, Cl. 210-363.000.
Husges, Gerd; Schuller, Edmund; Karl, Rupert; and Grimm, Eberhard, to Schubert & Salzer. Method and mechanism for elimination of an irregularity in a yarn. 4,223,517, Cl. 57-261.000.
Hussein, Said S. Switching arrangement for model trains. 4,223,857, Cl. 246-231.000.
Hutchins, Roger W. Body motion compensation filter. 4,223,556, Cl. 73-179.000.
Hylsa, S.A.: *See*—
Martinez-Vera, Enrique R.; and Berrun-Castanon, Jorge D., 4,224,057, Cl. 75-35.000.
Iceslj A.G.: *See*—
Olivieri, Icaro, 4,223,900, Cl. 280-11.120.
Ichinose, Isao; Mori, Fumio; and Kunimoto, Go, to Toyo Seikan Kaisha, Ltd. Peelable bonded structures and process for preparing same. 4,224,379, Cl. 428-461.000.
Ichitsuka, Nobuo: *See*—
Takeda, Susumu; Hazama, Kiyoaki; and Ichitsuka, Nobuo, 4,223,992, Cl. 354-266.000.
Ida, Masaru, to Nippon Gakki Seizo Kabushiki Kaisha. Tuning indicator system for FM radio receiver. 4,224,691, Cl. 455-159.000.
Iguchi, Yasuhide, to Toko, Inc. Stabilized power supply circuit. 4,224,659, Cl. 363-20.000.
Ihara Chemical Industry Co., Ltd.: *See*—
Takahashi, Nobuo; Uchiyama, Masanobu; Futami, Takaaki; and Imamiya, Yoji, 4,224,300, Cl. 423-416.000.
Ihde, Richard C.: *See*—
Thompson, Kenneth P.; Ihde, Richard C.; and Roth, Clarence E., 4,224,092, Cl. 156-82.000.
Ihlefeldt, Dietmar: *See*—
Schmider, Paul; Mandl, Herwig; and Ihlefeldt, Dietmar, 4,223,558, Cl. 73-421.00R.
Iijima, Takashi: *See*—
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Ikarashi, Takeo: *See*—
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
Ikeda, Yoshihiko: *See*—
Sato, Hiroo; Ikeda, Yoshihiko; and Katsumata, Mitsuo, 4,223,657, Cl. 123-179.00K.
Ikegawa, Hideaki: *See*—
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Ikezawa, Kenji: *See*—
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Illinois Tool Works Inc.: *See*—
Barth, Gerald D.; and Durham, Walter T., 4,223,585, Cl. 85-42.000.
Imamiya, Yoji: *See*—
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Imaseki, Izumi: *See*—
Kawasaki, Yoshimi; Imaseki, Izumi; Hirano, Satoshi; Amano, Katsuhiko; and Shigematsu, Masatsune, 4,224,195, Cl. 252-546.000.
Imperial Chemical Industries Limited: *See*—
Pears, Gordon E. A., 4,224,270, Cl. 264-171.000.
Topham, Arthur, 4,224,212, Cl. 260-33.60R.
Inaga, Hisashi, to Kioritz Corporation. Cord-type mowing machine. 4,223,440, Cl. 30-276.000.
Independent Power Company, Inc.: *See*—
Jacobson, J. Merritt, 4,224,082, Cl. 136-248.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Belisomi, Pietro, 4,224,639, Cl. 358-158.000.
Industrie Pirelli S.p.A.: *See*—
Gallizia, Achille, 4,224,276, Cl. 264-571.000.
Occhini, Elio; and Morello, Aldo, 4,224,462, Cl. 174-37.000.
Industriewerk Schaeffler OHG: *See*—
Zielfleisch, Jorg, 4,223,962, Cl. 308-184.00R.
Inoue, Hiroshi: *See*—
Komatsu, Shigeru; and Inoue, Hiroshi, 4,224,088, Cl. 148-187.000.
Institute of Gas Technology: *See*—
Bodle, William W.; and Punwani, Dharamvir, 4,223,449, Cl. 34-9.000.
International Business Machines Corporation: *See*—
Conner, David E.; Hoffman, Charles R.; and Laakso, Melvin T., 4,224,684, Cl. 364-900.000.
Lewis, David O.; Reed, John W.; and Wallin, Gary W., 4,224,667, Cl. 364-200.000.
Powell, Jimmie L.; and Tummala, Rao R., 4,224,627, Cl. 346-75.000.
Romankiw, Lubomyr T., 4,224,361, Cl. 427-259.000.
Tamulis, John C., 4,224,589, Cl. 335-237.000.
International Flavors & Fragrances Inc.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,224,352, Cl. 426-538.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,176, Cl. 252-174.110.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,346, Cl. 426-3.000.
International Institute of Differentiation Limited, The: *See*—
Viza, Dimitri; Adamopoulos, Dimitri; and Phillips, John, 4,224,404, Cl. 435-2.000.
International Minerals and Chemical Corporation: *See*—
Hodge, Edward B., 4,224,246, Cl. 260-570.600.
Young, Vernon V., 4,224,324, Cl. 424-250.000.
International Nickel Co., Inc., The: *See*—
Brendel, Thomas A.; and Turillon, Pierre P., 4,224,085, Cl. 148-11.50P.
International Standard Electric Corporation: *See*—
Ruzic, Hugo, 4,224,465, Cl. 174-135.000.
International Telephone and Telegraph Corporation: *See*—
Peirish, Alfred J., Jr.; and Knepshield, Robert E., 4,224,599, Cl. 340-84.000.
Inventec International Limited: *See*—
Hickman, Ronald P., 4,223,881, Cl. 269-139.000.
Inverarity, George: *See*—
Ogden, Dennis H.; and Inverarity, George, 4,224,423, Cl. 525-515.000.
Isaia, Robert L.; Bell, Francis D.; and Shelby, Robert L., to Caterpillar Tractor Co. Modular recoil mechanism. 4,223,878, Cl. 267-34.000.
Ishanov, Alexandr P.: *See*—
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Ishibashi, Tadashi: *See*—
Kohyama, Masaharu; Ishibashi, Tadashi; and Watanabe, Rokuro, 4,224,093, Cl. 156-99.000.
Ishige, Yoshiki; Kinugasa, Toshiyuki; Ando, Yoshio; and Sato, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Process of manufacturing a heat-resistant composite sheet. 4,224,376, Cl. 428-315.000.
Ishiguro, Shoji: *See*—
Toda, Yuzo; Adachi, Keiichi; Ishiguro, Shoji; and Nakayama, Yasuhiro, 4,224,403, Cl. 430-537.000.
Ishikawa, Katsuji, to West Electric Co., Ltd. Electronic flash with automatic duration control. 4,224,555, Cl. 315-151.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See*—
Kitayama, Hitoshi, 4,223,593, Cl. 91-477.000.
Tomizawa, Fumio; Sezaki, Kazuo; Shimizu, Makoto; and Katahashi, Yukinaga, 4,224,056, Cl. 75-11.000.
Ishitani, Shigeo: *See*—
Kimura, Shinji; Takao, Hiroshi; Ishitani, Shigeo; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,224,113, Cl. 204-1.00T.
Isozaki, Osamu: *See*—
Iwai, Hiroshi; Sukejima, Hajime; and Isozaki, Osamu, 4,224,357, Cl. 427-44.000.
ITI Limited: *See*—
Mougin, Georges L., 4,223,627, Cl. 114-242.000.
Ito, Masao: *See*—
Umezawa, Hiroyuki; Ito, Masao; and Okada, Hitoshi, 4,224,647, Cl. 360-96.300.
Ito, Shunji: *See*—
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,223,874, Cl. 266-129.000.
Ito, Sumio: *See*—
Nohira, Hidetaka; Ito, Sumio; Kumai, Teruo; and Oki, Hisashi, 4,223,645, Cl. 123-292.000.
Itsuo, Okumoto: *See*—
Fujii, Setsuro; Watanabe, Tsuyoshi; Shiota, Masashi; Itsuo, Okumoto; and Kayama, Naohiro, 4,224,342, Cl. 424-310.000.
Ivanova, Svetlana A.: *See*—
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M., 4,224,661, Cl. 363-71.000.
Iwai, Hiroshi; Sukejima, Hajime; and Isozaki, Osamu, to Kansai Paint Co., Ltd. Method and composition for forming electron beam curing high build coating. 4,224,357, Cl. 427-44.000.
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, to Tokyo Shibaura Denki Kabushiki Kaisha. Green light emitting device. 4,224,632, Cl. 357-17.000.
Iwamuro, Yoshiyuki: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,224,103, Cl. 162-135.000.
Iwanaga, Kazuyoshi, to Nissan Motor Company, Limited. Parking mechanism in automatic transmission. 4,223,768, Cl. 192-4.00A.
Iwanaga, Kazuyoshi: *See*—
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,566, Cl. 74-606.00R.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,570, Cl. 74-695.000.
Iwao, Jun-ichi; Oya, Masayuki; Kato, Eishin; and Watanabe, Toshio, to Santen Pharmaceutical Co., Ltd. Process for manufacturing optically active sulfur-containing carboxylic acid. 4,224,457, Cl. 562-401.000.
Iwata, Norio; and Kojima, Hiroshi, to Bridgestone Tire Company, Limited. Pneumatic tire for heavy duty vehicles. 4,223,712, Cl. 152-209.00D.
Iyeta, Motoi, to Nippon Gakki Seizo Kabushiki Kaisha. Auto-steering system. 4,223,624, Cl. 114-144.00E.
Izawa, Tatsuo; Kuwabara, Toru; Masuda, Yuichi; and Kameo, Yuji, to Nippon Telegraph and Telephone Public Corporation; and Sumitomo Electric Industries, Ltd. Method for manufacturing an optical fiber preform. 4,224,046, Cl. 65-3.00A.
Izumida, Haruo: *See*—
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.
J. B. Foote Foundry Co., The: *See*—
Violet, Jon A.; and Hauser, Hans, 4,223,997, Cl. 366-47.000.
J. I. Case Company: *See*—
Morris, Marvin L., 4,223,462, Cl. 37-191.00A.
J. S. Staedtler: *See*—
Endres, Bernhard, 4,224,000, Cl. 401-198.000.
Jackman, Robert A.: *See*—
Meyer, Ronald W.; and Jackman, Robert A., 4,223,476, Cl. 46-257.000.
Jackson, Thomas P.; and Fine, Laughton T., to Dosimeter Corporation of America. Dosimeter charging and/or reading apparatus. 4,224,522, Cl. 250-377.000.
Jacobs, Eli S.: *See*—
Russell, James T., 4,224,481, Cl. 179-100.30B.
Jacobson, J. Merritt, to Independent Power Company, Inc. Multi-functional solar collector pole. 4,224,082, Cl. 136-248.000.
Jacques. Hand held stringed instrument case and stand. 4,223,785, Cl. 206-314.000.
Jaeger, Arthur; Gunderlock, Richard; and Harwood, Richard J., to Merck & Co., Inc. Reclosable thermoformed blister-type package. 4,223,788, Cl. 206-468.000.
Jaenke, Else M. K., legal representative, Birge M. Jaenke, Ann K. Jaenke, heirs: *See*—
Jaenke, Hans-Jurgen A. W., deceased; Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, 4,223,653, Cl. 123-366.000.
Jaenke, Hans-Jurgen A. W., deceased (by Jaenke, Else M. K., legal representative, Birge M. Jaenke, Ann K. Jaenke, heirs); Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, to Robert Bosch GmbH. Control apparatus for limiting the fuel supply quantity of a fuel injection pump for internal combustion engines. 4,223,653, Cl. 123-366.000.
Jagenberg Werke Aktiengesellschaft: *See*—
Buschmann, Gerhard, 4,223,806, Cl. 222-23.000.

Jain, Kamlesh K., to Fram Industrial Filter Corporation. Process and apparatus for separating solids from suspensions of influent. 4,224,157, Cl. 210-208.000.

James Cash Machine Co.: *See—*
Cash, David R., 4,223,510, Cl. 53-258.000.

James G. Brown & Associates, Inc.: *See—*
Dysarz, Edward D., 4,224,005, Cl. 405-196.000.

Janiszewski, Grzegorz K.: *See—*
Weiertz, Stig H. A.; and Janiszewski, Grzegorz K., 4,223,572, Cl. 74-781.00R.

Janz, Joachim; and Schneider, Manfred, to Gebr. Happich GmbH. Glove compartment lid for vehicles, or the like. 4,223,940, Cl. 296-37.120.

Janzen, administratrix; by Susana: *See—*
Janzen, George, deceased; and Janzen, administratrix; by Susana, 4,223,941, Cl. 296-100.000.

Janzen, George, deceased; and Janzen, administratrix; by Susana. Truck box and cover assembly. 4,223,941, Cl. 296-100.000.

Japan Steel Works, Inc., The: *See—*
Ohnishi, Keizo; Adachi, Takao; Fuji, Akiyoshi; and Chiba, Ryuichi, 4,224,360, Cl. 427-239.000.

Jaquet, Jean-Claude; Heckler, Manfred; and Zoller, Heinrich, to Swiss Aluminium Ltd. Aluminum base alloy. 4,224,065, Cl. 75-139.000.

Jaszlits, Laszlo: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Jaunin, Jean-Pierre, to Societe Suisse pour l'Industrie Horlogere Management Services, S.A. Sequential display for digital chronograph. 4,223,525, Cl. 368-113.000.

Jenkins, James F.: *See—*
Sergev, Sergius S.; Black, Stanley A.; and Jenkins, James F., 4,223,661, Cl. 126-204.000.

Jensen, Bruce W.; and Bacon, David L., to Livingston, Lawrence E.; and Livingston, Victoria A., part interest to each. Woodsplitter utilizing screw member. 4,223,707, Cl. 144-193.00R.

Jess, Thurman S.: *See—*
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.

Jobsis, Frans F., to Duke University, Inc. Method and apparatus for monitoring metabolism in body organs in vivo. 4,223,680, Cl. 128-633.000.

Joch, Wilhelm: *See—*
Flick, Wilhelm; Richtzenhain, Hermann; Hunger, Volker; and Joch, Wilhelm, 4,224,234, Cl. 260-448.80A.

Johansson, Gillis: *See—*
Fiedler-Linnersund, Ulla M.; Bhatti, Khan M.; and Johansson, Gillis, 4,224,114, Cl. 204-1.00T.

Johnson, Carl O. Wood carrier. 4,223,818, Cl. 224-45.00E.

Johnson, Richard C.: *See—*
Marlett, Calvin J.; Reed, Edwin A.; Johnson, Richard C.; and Hug, William F., 4,224,579, Cl. 331-94.50G.

Johnson, Steven D., to Cook Paint and Varnish Company. Single package inorganic zinc rich paints having a silicate and titanate ester copolymer binder. 4,224,213, Cl. 260-37.0SB.

Johnson, Thomas A.: *See—*
Kunz, Nance D.; Johnson, Thomas A.; and Milligan, Barton, 4,224,249, Cl. 260-580.000.

Johnston, David B. R.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,224,336, Cl. 424-274.000.

Johnston, David H.: *See—*
Patel, Pravin K.; Johnston, David H.; and Makaeff, John, deceased, 4,224,381, Cl. 428-652.000.

Johnstone, Charles W., to Schlumberger Technology Corporation. Methods and apparatus for measuring thermal neutron decay characteristics of earth formations. 4,224,516, Cl. 250-262.000.

Jolly, Jean: *See—*
Amiard, Gaston; Bormann, Dieter; Duerckheimer, Walter; and Jolly, Jean, 4,224,371, Cl. 424-246.000.

Jones, Henry B.: *See—*
Smith, Randlow; MacLean, John P.; Williams, Dale; Barkley, Rich W.; and Jones, Henry B., 4,223,843, Cl. 239-558.000.

Jones, Marshall G., to General Electric Company. Laser welding aluminum to copper. 4,224,499, Cl. 219-121.0LM.

Jones, Marvin R., to Cameron Iron Works, Inc. Flow line switch. 4,223,700, Cl. 137-874.000.

Jordan, Nicholas: *See—*
Lown, Bernard; and Jordan, Nicholas, 4,223,683, Cl. 128-706.000.

Jorgensen, Carsten, to Copco, Inc. Convertible household utensil assembly. 4,223,936, Cl. 294-16.000.

Joseph, A. David: *See—*
Anderson, David L.; and Joseph, A. David, 4,224,161, Cl. 210-232.000.

Jost, John W., to Union Oil Company of California. Preventing scale deposition from geothermal fluids. 4,224,151, Cl. 210-696.000.

Joyal Products, Inc.: *See—*
Riordan, Edward D.; and Mangan, John P., 4,224,496, Cl. 219-110.000.

Judd Valve Company, Inc.: *See—*
Pendleton, Jack G., 4,223,697, Cl. 137-527.800.

Juhran, Wolfgang: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 4,224,438, Cl. 536-26.000.

Jungverdorben, Hermann-Josef: *See—*
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, 4,224,269, Cl. 264-171.000.

Jyojiki, Masao; and Nakamura, Kazuo, to Asahi Kogaku Kogyo Kabushiki Kaisha. Camera having a focusing device. 4,223,988, Cl. 354-25.000.

Kabushiki Kaisha Chuck Seisakusho: *See—*
Sakamoto, Kaneaki, 4,223,543, Cl. 72-30.000.

Kabushiki Kaisha Suwa Seikosha: *See—*
Kamijo, Noriyuki, 4,223,523, Cl. 368-74.000.

Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See—*
Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,223,915, Cl. 280-804.000.
Usami, Susumu; Asai, Toshiaki; and Tsujiuchi, Yoshio, 4,223,914, Cl. 280-803.000.

Kabushiki Kaisha Tsumura Jutendo: *See—*
Kawasaki, Yoshimi; Imaseki, Izumi; Hirano, Satoshi; Amano, Katsuhiko; and Shigematsu, Masatsune, 4,224,195, Cl. 252-546.000.

Kabushiki Kaisha Yoneya Gangu: *See—*
Yonezawa, Hiroichi, 4,223,470, Cl. 46-5.000.

Kaempf, Bernd: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.

Kageyama, Akira: *See—*
Maekawa, Iwao; Uchigasaki, Isao; Takamizawa, Shouzi; and Kageyama, Akira, 4,224,430, Cl. 526-282.000.

Kaiser, Werner; and Greiner, Harry, to M.A.N.-ROLAND Druckmaschinen Aktiengesellschaft. Warning system for printing presses. 4,224,613, Cl. 340-679.000.

Kaizuka, Masao: *See—*
Tanaka, Teruaki; Kaizuka, Masao; Takagi, Yuichi; and Aihara, Mitsuo, 4,223,526, Cl. 368-84.000.

Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, to Kawasaki Steel Corporation. Shaft furnace for producing low-oxygen iron-base metallic powder for powder metallurgy. 4,223,874, Cl. 266-129.000.

Kajiyoshi, Hidenori: *See—*
Sato, Masatoshi; and Kajiyoshi, Hidenori, 4,223,419, Cl. 15-327.00C.

Kalinin, Eduard A.: *See—*
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.

Kamagata, Toshio; and Kishino, Takao, to Futaba Denshi Kogyo K.K. Luminescent analog-display device driven in response to two out of phase timing pulses. 4,224,616, Cl. 340-753.000.

Kameo, Yuji: *See—*
Izawa, Tatsuo; Kuwabara, Toru; Masuda, Yuichi; and Kameo, Yuji, 4,224,046, Cl. 65-3.00A.

Kamijo, Noriyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic analog alarm timepiece. 4,223,523, Cl. 368-74.000.

Kamin, Ralph A., Jr.: *See—*
Loving, Robert O., Jr.; and Kamin, Ralph A., Jr., 4,224,586, Cl. 333-192.000.

Kaminski, William, to Bell Telephone Laboratories, Incorporated. Commutating capacitive envelope detector. 4,224,582, Cl. 333-173.000.

Kamiyama, Yasuo: *See—*
Saitoh, Mituo; and Kamiyama, Yasuo, 4,223,521, Cl. 368-204.000.

Kampe, Wolfgang: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 4,224,438, Cl. 536-26.000.

Kanazawa, Hiroyuki; and Futagami, Mikio, to Sumitomo Chemical Company, Limited. Heat curable coating compositions comprising partially hydrolyzed silicon compounds, acrylic copolymers and etherated methylolmelamine. 4,224,211, Cl. 260-31.20R.

Kanda, Hajime, to Ricoh Company, Limited. Abnormality indication system of facsimile apparatus. 4,224,641, Cl. 358-257.000.

Kane, Bernard J.; and Traynor, Sean G., to SCM Corporation. Preparation of para-menth-1-ene-7-sulfonate salts and corresponding acids. 4,224,240, Cl. 260-503.000.

Kaneko, Takao: *See—*
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.

Kaneyasu, Masao, to Dentsu Central Kabushiki Kaisha. Lighter with cigarette package holder portion. 4,223,784, Cl. 206-88.000.

Kankaanpa , Matti, to Valmet Oy. Paper manufacturing structure particularly for detaching a web from a wire. 4,224,104, Cl. 162-205.000.

Kanno, Hidenori: *See—*
Ban, Itsuki; and Kanno, Hidenori, 4,224,650, Cl. 360-137.000.

Kansai Paint Co., Ltd.: *See—*
Iwai, Hiroshi; Sukejima, Hajime; and Isozaki, Osamu, 4,224,357, Cl. 427-44.000.

Kao, Charles T., to Recognition Equipment Incorporated. Error correcting bar code reader. 4,224,508, Cl. 235-437.000.

Kao, Jar-lin: *See—*
Wheaton, Gregory A.; Kao, Jar-lin; and Sheng, Ming N., 4,224,223, Cl. 260-340.200.

Kao Soap Company: *See—*
Nakagawa, Yunosuke; and Fujii, Kozo, 4,224,205, Cl. 260-29.60B.

Kaplan, Leonard, to Union Carbide Corporation. Catalytic process for polyhydric alcohols and derivatives. 4,224,237, Cl. 260-449.00L.
Karch, John A.: *See*—
Masologites, George P.; Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,224,038, Cl. 44-1.0SR.
Karl, Rupert; and Schuller, Edmund, to Schubert & Salzer. Suction air nozzle for forming a thread reserve. 4,223,518, Cl. 57-263.000.
Karl, Rupert: *See*—
Husges, Gerd; Schuller, Edmund; Karl, Rupert; and Grimm, Eberhard, 4,223,517, Cl. 57-261.000.
Karlsson, Jarding U., to ABU Aktiebolag. Multiplier fishing reel with a level-wind. 4,223,854, Cl. 242-213.000.
Karson, Theodore R. Stereo speaker system. 4,224,469, Cl. 179-1.00E.
Kartridg Pak Co., The: *See*—
Wells, Roy E., 4,223,508, Cl. 53-138.00R.
Kasami, Akinobu: *See*—
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,224,632, Cl. 357-17.000.
Kashuba, Boris P.: *See*—
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Kasuga, Yukinori: *See*—
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.
Kasztreiner, Endre: *See*—
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.
Katahashi, Yukinaga: *See*—
Tomizawa, Fumio; Sezaki, Kazuo; Shimizu, Makoto; and Katahashi, Yukinaga, 4,224,056, Cl. 75-11.000.
Katchman, Arthur: *See*—
Cooper, Glenn D.; and Katchman, Arthur, 4,224,209, Cl. 260-30.60R.
Katinsky, John: *See*—
Sappington, Marr D.; and Katinsky, John, 4,223,638, Cl. 119-52.00B.
Kato, Eishin: *See*—
Iwao, Jun-ichi; Oya, Masayuki; Kato, Eishin; and Watanabe, Toshio, 4,224,457, Cl. 562-401.000.
Kato, Makoto: *See*—
Satoh, Isao; and Kato, Makoto, 4,224,480, Cl. 179-100.30G.
Kato, Mitsumi; and Niimi, Koji, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument by nonlinearly addressing waveform memory. 4,223,582, Cl. 84-1.010.
Katsube, Junki: *See*—
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,224,344, Cl. 424-330.000.
Katsumata, Mitsuo: *See*—
Sato, Hiroo; Ikeda, Yoshihiko; and Katsumata, Mitsuo, 4,223,657, Cl. 123-179.00K.
Katz, Lawrence E.: *See*—
Tobin, John H.; Gay, Walter A.; and Katz, Lawrence E., 4,224,449, Cl. 548-128.000.
Kauffman, Robert N.: *See*—
Smith, James D. B.; and Kauffman, Robert N., 4,224,541, Cl. 310-45.000.
Kaul, Pradman; Gabbard, Ova G.; Muzumdar, Deepak; and Eklof, Anders, to Digital Communications Corporation. TDMA Multiplexer-demultiplexer with multiple ports. 4,224,473, Cl. 370-84.000.
Kawabata, Frederick Y.; and Wane, William M., to Tektronix, Inc. High-frequency etched circuit board connector. 4,223,968, Cl. 339-14.00R.
Kawabe, Naoshi: *See*—
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.
Kawaguchi, Kiyokazu: *See*—
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.
Kawai Musical Instrument Mfg. Co., Ltd.: *See*—
Deutsch, Ralph, 4,223,583, Cl. 84-1.010.
Kawamura, Koichi; Honda, Junichi; Hisatomi, Junichirou; and Shigemasa, Junichiro, to Sharp Kabushiki Kaisha. Solar cell sealed by glass laminations. 4,224,081, Cl. 136-251.000.
Kawamura, Yasunori: *See*—
Yukimoto, Kazuyoshi; Ogasawara, Shinzi; Sakamoto, Mitsuhiro; and Kawamura, Yasunori, 4,223,420, Cl. 16-128.100.
Kawano, Masatoshi; Hashimoto, Tsutomu; and Furuya, Miyuki, to Matsushita Electric Industrial Co., Ltd. Small-sized motor with centrifugal governor switch. 4,224,542, Cl. 310-68.00E.
Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Fujino, Yoshikazu, 4,224,010, Cl. 415-199.200.
Kawasaki Steel Corporation: *See*—
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,223,874, Cl. 266-129.000.
Kawasaki, Yoshimi; Imaseki, Izumi; Hirano, Satoshi; Amano, Katsuhiko; and Shigematsu, Masatsune, to Kabushiki Kaisha Tsumura Jutendo. Process for handwashing socks or stockings. 4,224,195, Cl. 252-546.000.
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Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, 4,224,098, Cl. 156-512.000.
Kay, D. Alan R.: *See*—
Wilson, William G.; and Kay, D. Alan R., 4,224,058, Cl. 75-58.000.
Kayama, Naohiro: *See*—
Fujii, Setsuro; Watanabe, Tsuyoshi; Shiota, Masashi; Itsuo, Okumoto; and Kayama, Naohiro, 4,224,342, Cl. 424-310.000.
Kaye, Gordon E.: *See*—
Ciliberti, Frank L., Jr.; and Kaye, Gordon E., 4,224,385, Cl. 429-66.000.
Kayne, Marvin L., to Valley Candle Mfg. Co., Inc. Locking arrangement for a candle. 4,224,017, Cl. 431-291.000.
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Takahama, Teizo; and Kazama, Toyoki, 4,224,280, Cl. 422-98.000.
Kechina, Galina D.: *See*—
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D., 4,224,291, Cl. 423-178.000.
Keefe, Harry. Bird feeder. 4,223,637, Cl. 119-52.00R.
Keeney, Lloyd E. Jet boat reversing unit. 4,223,630, Cl. 440-41.000.
Keiper Automobiltechnik GmbH & Co. KG: *See*—
Cremer, Heinz P., 4,223,947, Cl. 297-367.000.
Kluting, Bernd A., 4,223,946, Cl. 297-363.000.
Keller, Douglas V., Jr.: *See*—
Smith, Clay D.; and Keller, Douglas V., Jr., 4,224,039, Cl. 44-10.00R.
Kelly, Thomas L. Roof equalizer. 4,223,486, Cl. 52-1.000.
Kelly, Thomas M. Separable mortar vehicle. 4,223,907, Cl. 280-408.000.
Kennecke, Mario: *See*—
Dahl, Helmut; Schottle, Ernst; Wieske, Reinhold; Weber, Alfred; and Kennecke, Mario, 4,224,320, Cl. 424-243.000.
Kent, Anthony J.; and Woodburn, William, to United Wire Group Limited. Sifting machines. 4,224,146, Cl. 209-243.000.
Kent, Jerry B., to New World Products, Inc. Tire protection composition. 4,224,208, Cl. 260-29.60B.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Langen, Hans; Naefe, Paul; and Ringel, Helmut, 4,224,258, Cl. 264-0.500.
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann-Josef, 4,224,313, Cl. 424-94.000.
Kernforschungszentrum Karlsruhe GmbH: *See*—
Lubecki, Andrzej; and Rieber, Klaus, 4,224,517, Cl. 250-272.000.
Kerrison, Ronald L. Direct bar oiler for chain saws. 4,223,438, Cl. 30-123.400.
Kershaw, Peter A., to Singer Company, The. Method of fusing a sight glass to a metal part. 4,224,047, Cl. 65-39.000.
Kervagoret, Gilbert, to Societe Anonyme D.B.A. Hydraulic circuit breaker. 4,223,694, Cl. 137-118.000.
Khavsky, Nikolai N.: *See*—
Glodin, Jury N.; Eliseenko, Albert G.; Pshenichkin, Petr A.; Smirnov, Evgeny A.; Khavsky, Nikolai N.; and Kuznetsov, Lev B., 4,223,963, Cl. 308-188.000.
Khlopkov, Leonid P.: *See*—
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.
Khoja, Mirza A.: *See*—
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Kido, Takeshi: *See*—
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Kiga, Hidetaka: *See*—
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
Kihara Sangyo Kabushiki Kaisha: *See*—
Kihara, Sueo, 4,223,458, Cl. 36-44.000.
Kihara, Sueo, to Kihara Sangyo Kabushiki Kaisha. Laminated shoe insole. 4,223,458, Cl. 36-44.000.
Kilgore, Bobby R. Tissue holder. 4,223,964, Cl. 312-39.000.
Kimberly Clark Corporation: *See*—
Schmidt, George F., 4,224,394, Cl. 429-252.000.
Kimura, Shinji; Takao, Hiroshi; Ishitani, Shigeo; Ikezawa, Kenji; and Aoki, Hiroyuki, to Nissan Motor Company, Limited. Method of detecting air/fuel ratio in combustor by detecting oxygen in combustion gas. 4,224,113, Cl. 204-1.00T.
Kinaga, Eiichi: *See*—
Mori, Mamoru; Sasaki, Shiro; and Kinaga, Eiichi, 4,223,917, Cl. 280-806.000.
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Kinder, Mark R., to TRW Inc. Hydraulic fan drive system. 4,223,646, Cl. 123-41.110.

Kine, Masayoshi, to Shimano Industrial Company, Limited. Mechanism for mounting a speed control lever to a bicycle. 4,223,563, Cl. 74-501.00R.
King, Jack B., to General Motors Corporation. Air cleaner with valve means for preventing fuel vapor escape. 4,224,044, Cl. 55-385.00R.
King, Johnnie L. Fishing apparatus. 4,223,466, Cl. 43-18.00R.
Kinugasa, Toshiyuki: *See*—
Ishige, Yoshiki; Kinugasa, Toshiyuki; Ando, Yoshio; and Sato, Shoji, 4,224,376, Cl. 428-315.000.
Kioritz Corporation: *See*—
Inaga, Hisashi, 4,223,440, Cl. 30-276.000.
Sato, Masatoshi; and Kajiyoshi, Hidenori, 4,223,419, Cl. 15-327.00C.
Kira, Hideshi: *See*—
Watanabe, Hiroshi; Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,224,581, Cl. 333-14.000.
Kirch, William; and Thompson, Paul A., to Chempiex Company. Polymerization process. 4,224,428, Cl. 526-106.000.
Kirner, Erich; and Dederra, Helmut. Liquid fuel rocket engine having a propellant component pump turbine with a secondary thrust discharge and to a method of operating a liquid fuel rocket engine. 4,223,530, Cl. 60-204.000.
Kishino, Takao: *See*—
Kamagata, Toshio; and Kishino, Takao, 4,224,616, Cl. 340-753.000.
Kitagawa, Kazuo: *See*—
Watanabe, Hiroshi; Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,224,581, Cl. 333-14.000.
Kitayama, Hitoshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Hydraulic motor. 4,223,593, Cl. 91-477.000.
Kitzinger, Frank, to Noranda Mines Limited. Oxygen monitoring circuit with built in testing means. 4,223,549, Cl. 73-1.00R.
Kiwala, Jacob: *See*—
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,176, Cl. 252-174.110.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,346, Cl. 426-3.000.
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of N-substituted α-ketocarboxylic acid amides. 4,224,226, Cl. 260-347.300.
Klein, Josef, to Reifenhauser KG. Blow-molding nozzle and method. 4,224,272, Cl. 264-209.000.
Kleinke, Bernard L.: *See*—
Lewis, Andrew G.; and Kleinke, Bernard L., 4,224,467, Cl. 179-1.00E.
Klemann, Lawrence P.; and Stogryn, Eugene L., to Exxon Research & Engineering Co. Method of preparing ether adducts of organic-alkali metal-boron salts. 4,224,256, Cl. 568-6.000.
Klemick, Richard E., to Liftanroll, Inc. Hydraulic lift truck. 4,223,901, Cl. 280-43.120.
Klenk, Herbert: *See*—
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,224,226, Cl. 260-347.300.
Klockner-Humboldt-Wedag AG: *See*—
Weigel, Horst; and Muller, Karl, 4,223,876, Cl. 266-156.000.
Kluting, Bernd A., to Keiper Automobiltechnik GmbH & Co. KG. Vehicle seat fitting. 4,223,946, Cl. 297-363.000.
Kluzik, Fritz: *See*—
Brehm, Bernd; and Kluzik, Fritz, 4,223,604, Cl. 101-415.100.
Kmoch, Gerhard: *See*—
Noack, Rolf; Frohlich, Friedhelm; Gramelt, Stefan; and Kmoch, Gerhard, 4,224,041, Cl. 55-208.000.
Knecht, Hans-Rudolf: *See*—
Fricker, Paul; Vogler, Gottfried; Knecht, Hans-Rudolf; Pierobon, Giampaolo; Schumacher, Bernd; and Zimmerman, Arnold, 4,224,495, Cl. 219-69.00V.
Knepshield, Robert E.: *See*—
Peirish, Alfred J., Jr.; and Knepshield, Robert E., 4,224,599, Cl. 340-84.000.
Knibb, Terence F.; and O'Rourke, Richard G., to Plessey Handel und Investments AG. Display devices. 4,224,116, Cl. 204-15.000.
Knickel, Elwyn R. Object locator system employing variable frequency code tone generators. 4,224,596, Cl. 340-24.000.
Knigge, Vincent L.: *See*—
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.
Knuth, Manfred; and Homann, Thorsten, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Press worm, especially for filter presses. 4,223,601, Cl. 100-117.000.
Knuth, William R.: *See*—
Cymbal, William D.; and Knuth, William R., 4,223,911, Cl. 280-731.000.
Kobayashi, Masahiro: *See*—
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,224,103, Cl. 162-135.000.
Kobayashi, Nobuo; and Nakano, Sadao, to Niles Parts Co., Ltd. Car door lock driving device. 4,223,927, Cl. 292-1.000.
Kobayashi, Seiichiro: *See*—
Mizuno, Hiroshi; and Kobayashi, Seiichiro, 4,223,754, Cl. 180-90.000.
Kobe Steel, Limited: *See*—
Fukunaga, Akio; and Nakane, Toshio, 4,223,531, Cl. 60-400.000.
Kochs Adler AG: *See*—
Upmeier, Egon; and Hagemeyer, Gunter, 4,223,617, Cl. 112-184.000.
Koel, Gerrit J.; and Bertens, Theodorus C. J. M., to U.S. Philips Corporation. Method of manufacturing a magnetic head by photo-etching. 4,224,400, Cl. 430-320.000.
Koenig & Bauer Aktiengesellschaft: *See*—
Kutzner, Willi A. P.; and Schneider, Georg, 4,223,823, Cl. 227-81.000.
Koerber, Marvin A.; and Kutnyak, Thomas A., to Automation Industries, Inc. Dual wire hose. 4,224,463, Cl. 174-47.000.
Koga, Kunitoshi: *See*—
Umemura, Sumio; Matsui, Kanenobu; Koga, Kunitoshi; and Kuniyoshi, Mineo, 4,224,456, Cl. 560-241.000.
Kohyama, Masaharu; Ishibashi, Tadashi; and Watanabe, Rokuro, to Hitachi, Ltd. Method for producing liquid crystal display elements. 4,224,093, Cl. 156-99.000.
Koivunen, Erkki A.; and Sherman, James F., to General Motors Corporation. Transverse transmission with parallel, coplanar axis. 4,223,569, Cl. 74-665.0GE.
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Iwata, Norio; and Kojima, Hiroshi, 4,223,712, Cl. 152-209.00D.
Kokubun, Keiichi: *See*—
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Kokusan Kenki Co., Ltd.: *See*—
Sato, Hiroo; Ikeda, Yoshihiko; and Katsumata, Mitsuo, 4,223,657, Cl. 123-179.00K.
Komaru, Isamu: *See*—
Sasaki, Tadao; Natori, Takasi; and Komaru, Isamu, 4,224,073, Cl. 106-44.000.
Komatsu, Shigeru; and Inoue, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method for manufacturing a semiconductor device. 4,224,088, Cl. 148-187.000.
Komossa, Werner: *See*—
Selonke, Fritz; Komossa, Werner; Elsner, Uwe; and Schlie, Gerhard, 4,223,845, Cl. 241-34.000.
Kondo, Hisao: *See*—
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,224,115, Cl. 204-15.000.
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Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, 4,224,225, Cl. 260-346.710.
Kondrashova, Lidia I.: *See*—
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.
Konig, Gunter; Mutschler, Gunter; Scheutle, Erich; and Bucher, Erich, to Zinser Textilmaschinen GmbH, Firma. False twisting-stretching-/texturizing machine. 4,223,519, Cl. 57-291.000.
Konishiroku Photo Industry Co. Ltd.: *See*—
Takeda, Susumu; Hazama, Kiyoaki; and Ichitsuka, Nobuo, 4,223,992, Cl. 354-266.000.
Konta, Yukio, to Tomy Kogyo Co., Inc. Bumper structure including drive mechanism. 4,223,889, Cl. 273-127.00R.
Kontz, Robert F., to Owens-Illinois, Inc. Parison handling assemblies and methods for handling parisons. 4,223,778, Cl. 198-389.000.
Kontz, Robert F., to Owens-Illinois, Inc. Method for blow molding. 4,224,263, Cl. 264-25.000.
Kordesch, Karl V.: *See*—
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Koreeda, Kiyoshi: *See*—
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, 4,223,616, Cl. 112-158.00E.
Korkowski, James F. Animal restraining device. 4,223,639, Cl. 119-98.000.
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D. Method of dehydrating carnallite. 4,224,291, Cl. 423-178.000.
Korth, John: *See*—
Mee, John M. L.; Halpern, Berthold; and Korth, John, 4,224,031, Cl. 23-230.00B.
Kosa, Edit: *See*—
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.
Kosarzecki, Constantine, to Modular Controls Corporation. Counterbalance valve. 4,223,693, Cl. 137-106.000.
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Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Kovacs, Ilona, nee Szabo: *See*—
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Koyo Machine Industries Co. Limited: *See*—
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, 4,223,616, Cl. 112-158.00E.

Koyo Seiko Co. Limited: *See—*
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, 4,223,616, Cl. 112-158.00E.
Kozawa, Akiya; and Kordesch, Karl V., to Union Carbide Corporation. Silver catalyzed manganese dioxide hydrogen gas absorber. 4,224,384, Cl. 429-57.000.
Kozyrev, Sergei P.: *See—*
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Kranz, Walter, to Messerschmitt-Bolkow-Blohm GmbH. Shaft drive alternately for both directions of rotation. 4,223,770, Cl. 192-0.070.
Kraus, Bernd: *See—*
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Krebel, Edgar A.; Vaden, Walter Z.; and Blanpied, Robert H., to Rmax, Inc. Insulating panel fastening system. 4,223,505, Cl. 52-509.000.
Krieger, Gregory A., to Allis-Chalmers Corporation. Isolated fuel tank. 4,223,899, Cl. 280-5.00A.
Kroger, Harry, to Sperry Corporation. Multiple weak-link SQUID. 4,224,630, Cl. 357-5.000.
Kronenberger, Paul E.: *See—*
Braden, Ralph S.; and Kronenberger, Paul E., 4,223,538, Cl. 62-443.000.
Kroon, Peter J., to Electric Power Research Institute, Inc. Chemically activated switch. 4,224,491, Cl. 200-150.00R.
Kroplinski, Thaddeus F.: *See—*
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., 4,224,164, Cl. 210-321.00B.
Krueger, William H., to Westinghouse Electric Corp. Reactor vessel stud turnout tool. 4,223,575, Cl. 81-57.380.
Krumreich, Charles L., to Bell Telephone Laboratories, Incorporated. Telephone jack. 4,224,485, Cl. 200-51.100.
Kruyer, Jan. Process for recovering bitumen from oil sand. 4,224,138, Cl. 208-11.0LE.
Kuban, W. G.: *See—*
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Kubo, Akihiro: *See—*
Sugiyama, Tomoyuki; Machida, Shigeru; Kubo, Akihiro; Araki, Junichi; and Nakamura, Nobuyuki, 4,223,565, Cl. 74-574.000.
Kubota Ltd.: *See—*
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, 4,224,061, Cl. 75-125.000.
Kubota, Tatsushi: *See—*
Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,223,915, Cl. 280-804.000.
Kueper, Theodore V.; and Donnelly, Thomas H., to Swift & Company. Gelatin dessert composition. 4,224,353, Cl. 426-576.000.
Kulle, Lee K.: *See—*
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.
Kullman, Russell M. H.: *See—*
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Kumai, Teruo: *See—*
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Kumm, Emerson L. Absorption solar powered air conditioning system with storage capacity. 4,223,535, Cl. 62-2.000.
Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., to Bell Telephone Laboratories, Incorporated. Mechanical optical fiber switching device. 4,223,978, Cl. 350-96.200.
Kunii, Tadashi: *See—*
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, to Koyo Seiko Co. Limited; and Koyo Machine Industries Co. Limited. System for generating stitch pattern signals for electronic sewing machine. 4,223,616, Cl. 112-158.00E.
Kunimoto, Go: *See—*
Ichinose, Isao; Mori, Fumio; and Kunimoto, Go, 4,224,379, Cl. 428-461.000.
Kuninaka, Akira: *See—*
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Kuniyoshi, Mineo: *See—*
Umemura, Sumio; Matsui, Kanenobu; Koga, Kunitoshi; and Kuniyoshi, Mineo, 4,224,456, Cl. 560-241.000.
Kunz, Nance D.; Johnson, Thomas A.; and Milligan, Barton, to Air Products and Chemicals, Inc. Toluene diamine from non-washed dinitrotoluene. 4,224,249, Cl. 260-580.000.
Kunz, Walter: *See—*
Hubele, Adolf; Eckhardt, Wolfgang; and Kunz, Walter, 4,224,337, Cl. 424-279.000.
Kurachi, Hisaharu. Device for coupling hose, pipe or the like. 4,223,919, Cl. 285-8.000.
Kuraray Co., Ltd.: *See—*
Kyo, Sunao; Tsuchiya, Haruo; and Tanaka, Hidetsugu, 4,224,252, Cl. 568-388.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See—*
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.
Kurita, Naoyasu: *See—*
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Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, 4,224,218, Cl. 260-45.7PH.
Kurnit, Norman A., to United States of America, Energy. Multistaged stokes injected Raman capillary waveguide amplifier. 4,224,577, Cl. 330-4.500.
Kurt Manufacturing Co., Inc.: *See—*
Wolfe, Ingo E.; and Kuban, W. G., 4,223,879, Cl. 269-32.000.
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Breen, Bernard P.; and Bell, Arlen W., 4,223,615, Cl. 110-264.000.
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Lallemand, Jacques, to Societe d'Etude et de Construction d'Appareils de Precision (S.E.C.A.P.). Device for locating the position of a movable component and especially a value-setting component in a franking machine. 4,224,603, Cl. 340-347.00P.
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Langen, Hans; Naefe, Paul; and Ringel, Helmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method and apparatus for producing spherical particles of uniform size of nuclear fuels or breeder materials. 4,224,258, Cl. 264-0.500.
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Chambers, Hubert H.; and Tear, Brian J., 4,224,080, Cl. 106-308.00Q.
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La Scala, William; and Buttiglione, Guido. Stationary drop or fin stream irrigation system for citrus orchards, fruit-trees, vegetables and fodder plants. 4,223,840, Cl. 239-207.000.

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Laven, Thomas R.; Hurley, Donald L.; Bange, Joseph B.; and Wessel, Francis H., to Western States Machine Company, The. Cyclical centrifugal machine. 4,224,165, Cl. 210-363.000.

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Liebler, Charles F.: *See—*
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Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., 4,223,454, Cl. 35-25.000.

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Loving, Robert O., Jr.; and Kamin, Ralph A., Jr., to Motorola, Inc. Monolithic crystal filter having a passband symmetrical about a center frequency. 4,224,586, Cl. 333-192.000.
Lovingood, James L., to Singer Company, The. Reversing hammer drill. 4,223,744, Cl. 173-48.000.
Lowe, Leonard A., to Stellar Industries, Inc. Solar heating system. 4,223,665, Cl. 126-449.000.
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Lubecki, Andrzej; and Rieber, Klaus, to Kernforschungszentrum Karlsruhe GmbH. Device for assaying uranium and/or thorium in ore specimens comprising gold foil for suppressing compton background. 4,224,517, Cl. 250-272.000.
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Luz, Robert J. Fishing lure. 4,223,469, Cl. 43-42.030.
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Lynch, Richard W., to Olin Corporation. Process for recycling chemical plant waste streams containing recoverable chlorine. 4,224,290, Cl. 423-158.000.
Lynch, Robert T.; and Reis, James J., to Northrop Corporation. Method and apparatus for implementing a processor based on the rationalized Haar transform for the purpose of real time compression of video data. 4,224,678, Cl. 364-724.000.
Lyons, William E.: *See—*
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Macedo, Pedro B.; Simmons, Joseph H.; and Litovitz, Theodore A., to Macedo, Pedro B.; and Litovitz, Theodore A. Fixation of radioactive materials in a glass matrix. 4,224,177, Cl. 252-301.10W.
Macey, Roy E. Monitoring the condition of an insulator. 4,224,612, Cl. 340-647.000.
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Macho, Heinz; Lange, Hans; Berger, Dieter; and Werner, Wolfgang, to Boehringer Mannheim GmbH. Coated slides and apparatus for coating same. 4,224,277, Cl. 422-57.000.
Mackal, Glenn H. Automatic inflator. 4,223,805, Cl. 222-5.000.
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Maekawa, Iwao; Uchigasaki, Isao; Takamizawa, Shouzi; and Kageyama, Akira, to Hitachi Chemical Company, Ltd. Resinous composition. 4,224,430, Cl. 526-282.000.
Magendans, Frederik; and van Rheenen, Bernhard J. P., to U.S. Philips Corporation. Method of manufacturing a laminated rotary anode for use in an x-ray tube. 4,224,273, Cl. 264-259.000.
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Maillet, Edgard J. Breaker-crusher mill with pivoted hammers. 4,223,844, Cl. 241-33.000.
Main, Ralph M., to Standun, Inc. Die lubricant nozzle for use in can bodymakers and the like. 4,223,544, Cl. 72-45.000.
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Makimoto, Mitsuo; and Yamashita, Sadahiko, to Matsushita Electric Industrial Co., Ltd. Comb-line bandpass filter. 4,224,587, Cl. 333-205.000.
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Mangan, John P.: *See—*
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Schulman, Joseph H.; Mann, Brian M.; and Beane, Russell R., 4,223,679, Cl. 128-419.0PT.
Mapco, Inc.: *See—*
Martin, Philip N., 4,223,759, Cl. 181-116.000.
Marais, Lionel R., to Compagnie Francaise des Petroles. Drilling using reverse circulation. 4,223,747, Cl. 175-65.000.
Marcadet, Ernest. Antiseptic composition for topical application to the skin. 4,224,319, Cl. 424-238.000.
Marcus, Franklyn M.: *See—*
Nikitits, Edwin, 4,223,945, Cl. 297-159.000.
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Brunet, Roger; and Marenco, Gerard, 4,223,623, Cl. 114-77.00R.
Margetts, Hugh G., to Girling Limited. Control valve assemblies for hydraulic braking systems. 4,223,954, Cl. 303-6.00A.

Margison, Arthur D.; and Trick, William T., to A. D. Margison Management Ltd. Prefabricated hydro-electric generating station. 4,224,526, Cl. 290-52.000.
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Markelov, Nikolai N.: *See*—
Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D., 4,223,908, Cl. 280-419.000.
Markiewicz, Jan, to Combustion Engineering, Inc. Feeder apparatus for cable cutter. 4,223,581, Cl. 83-167.000.
Marlett, Calvin J.; Reed, Edwin A.; Johnson, Richard C.; and Hug, William F., to Xerox Corporation. Metal vapor laser discharge tube. 4,224,579, Cl. 331-94.50G.
Marmon Group, Inc., The: *See*—
Williams, Gerald D., 4,223,825, Cl. 228-114.000.
Marrodan Y Rezola, S.A.: *See*—
Adarraga, Javier M. R., 4,223,600, Cl. 100-37.000.
Marshall, Nickolas J. Packaging means. 4,223,783, Cl. 206-45.140.
Marshall and Williams Company: *See*—
Wyman, Floyd H., 4,224,166, Cl. 210-396.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, to Roussel Uclaf. Novel cyclopropane carboxylic acid esters. 4,224,227, Cl. 260-347.400.
Martin Marietta Corporation: *See*—
Moitra, Santanu; and Rosskopf, Philip A., 4,224,076, Cl. 106-90.000.
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Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,497, Cl. 219-121.0LM.
Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,498, Cl. 219-121.00L.
Martin, Philip N., to Mapco, Inc. Low energy source for seismic operation. 4,223,759, Cl. 181-116.000.
Martin, Ronald D. Dispensing device. 4,223,809, Cl. 222-96.000.
Martinez, Joachim, to R.K.S. Orientation ring with bearings. 4,223,961, Cl. 308-174.000.
Martinez, Luis M. Ring with internal means for varying size. 4,223,541, Cl. 63-15.600.
Martinez-Vera, Enrique R.; and Berrun-Castanon, Jorge D., to Hylsa, S.A. Method for carburizing sponge iron. 4,224,057, Cl. 75-35.000.
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Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,224,063, Cl. 75-129.000.
Marzocchi, Alfred, to Owens-Corning Fiberglas Corporation. Fibrous product of non-woven glass fibers and method and apparatus for producing same. 4,224,373, Cl. 428-288.000.
Mascaro, Thomas E. Composite aluminum jack poles. 4,223,507, Cl. 52-730.000.
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Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., 4,224,242, Cl. 260-553.00A.
Masologites, George P.; Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., to Atlantic Richfield Company. Process for removing sulfur from coal. 4,224,038, Cl. 44-1.0SR.
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Schoendorfer, Donald W.; and Raymond, Stephen A., 4,223,411, Cl. 3-1.300.
Wurtman, Richard J., 4,224,343, Cl. 424-319.000.
Massaroli, Giangiacomo, to Poli Industria Chimica S.p.A. 4-Pyrimidyl sulfides for the treatment of gastric ulcers. 4,224,327, Cl. 424-251.000.
Masso, Jon D., to American Optical Corporation. Enhanced bonding of silicon oxides and silver by intermediate coating of metal. 4,223,974, Cl. 350-1.700.
Massucco, Arthur A.: *See*—
Merrill, Richard E.; and Massucco, Arthur A., 4,224,399, Cl. 430-282.000.
Mast, Peter. Material for making pourable and paste-like materials. 4,224,075, Cl. 106-55.000.
Masuda, Yuichi: *See*—
Izawa, Tatsuo; Kuwabara, Toru; Masuda, Yuichi; and Kameo, Yuji, 4,224,046, Cl. 65-3.00A.
Matera, Giancarlo: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Malgeri, Domenico; and Cavallaro, Antonino, 4,224,210, Cl. 260-32.60N.
Matherne, Steven J. Stategy game. 4,223,892, Cl. 273-248.000.
Mathis Fertigputz GmbH: *See*—
Mathis, Paul; and Zimmer, Max, 4,223,996, Cl. 366-27.000.
Mathis, Paul; and Zimmer, Max, to Mathis Fertigputz GmbH. Apparatus for mixing solid and liquid constituents of mortar or the like. 4,223,996, Cl. 366-27.000.
Mathus, Gregory: *See*—
Lowry, Alan B.; Roche, David E.; and Mathus, Gregory, 4,223,787, Cl. 206-387.000.
Matkova, Taisia A.: *See*—
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M., 4,224,661, Cl. 363-71.000.
Matsufuji, Akihiro: *See*—
Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, 4,224,225, Cl. 260-346.710.
Matsui, Kanenobu: *See*—
Umemura, Sumio; Matsui, Kanenobu; Koga, Kunitoshi; and Kuniyoshi, Mineo, 4,224,456, Cl. 560-241.000.
Matsumoto, Ken, to Eli Lilly and Company. Immunosuppressive agents. 4,224,326, Cl. 424-251.000.
Matsumoto, Norichika: *See*—
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,224,441, Cl. 544-16.000.
Matsumura, Akira: *See*—
Yanagishima, Takayuki; and Matsumura, Akira, 4,224,609, Cl. 340-576.000.
Matsuo Electric Company, Limited: *See*—
Hori, Yoshio, 4,223,786, Cl. 206-330.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kawano, Masatoshi; Hashimoto, Tsutomu; and Furuya, Miyuki, 4,224,542, Cl. 310-68.00E.
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,224,587, Cl. 333-205.000.
Nakamura, Kenichi; Nankai, Shiro; Iijima, Takashi; and Fukuda, Masataro, 4,224,125, Cl. 204-195.00B.
Satoh, Isao; and Kato, Makoto, 4,224,480, Cl. 179-100.30G.
Matsushita, Kunichi: *See*—
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.
Mattel, Inc.: *See*—
Fekete, Ferenc; Halford, Wayne R.; and Hirtle, Michael O., 4,223,472, Cl. 46-44.000.
Guerrero, Benjamin G., 4,223,561, Cl. 74-105.000.
Mauch, Paul A., to Ampex Corporation. Method and apparatus for controlling the movement of a recording medium. 4,224,645, Cl. 360-73.000.
Maurer, Karl: *See*—
Buergle, Peter; Maurer, Karl; Munzer, Manfred; Rosskopp, Wilhelm; and Wenzel, Franz, 4,224,425, Cl. 526-85.000.
Mauthe, Manfred, to Siemens Aktiengesellschaft. Dynamic storage element having static storage element behavior. 4,224,635, Cl. 357-41.000.
Mawatari, Akinori; Yamaguchi, Hirohisa; Nakamura, Kenji; and Uchiumi, Satoshi, to TEAC Corporation. PCM Recording and reproducing method providing for dropout compensation. 4,224,642, Cl. 360-32.000.
Mayer, Edward A., to Texaco Inc. Smoke filter for internal combustion engines. 4,224,285, Cl. 422-179.000.
Mazzucato, Fabio; and Tenti, Roberto, to Texaco Inc. Tanker desludging system. 4,223,622, Cl. 114-74.00R.
McCabe, Edward G., Jr. Moisture absorption sectional pack. 4,224,366, Cl. 428-72.000.
McCall, Arthur A. Press-feed units. 4,223,821, Cl. 226-101.000.
McCarroll, John J.: *See*—
Foster, Alan I.; McCarroll, John J.; and Tennison, Stephen R., 4,224,192, Cl. 252-466.00B.
McCarty, Horace G.: *See*—
Halls, Lawrence M.; and McCarty, Horace G., 4,223,514, Cl. 56-299.000.
McCluhan, Thomas K.: *See*—
Bilek, Paul J.; Henning, William A.; McCluhan, Thomas K.; and Dong, Julian M., 4,224,064, Cl. 75-130.00R.
McClure, Lyle D.: *See*—
Nichols, James W.; Lawrence, Rodney G.; and McClure, Lyle D., 4,224,204, Cl. 260-23.00H.
McColl, Bruce J., to Owens-Illinois, Inc. Suspension assembly for off-road vehicle. 4,223,904, Cl. 280-104.000.
McCord, James W. Cleaning device. 4,224,110, Cl. 202-169.000.
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., to Lord Corporation. Photoinitiation systems for free radical polymerization reactions. 4,224,454, Cl. 560-12.000.
McGahey, Dean C., to Texaco Inc. Closed fuel system with vacuum assist. 4,223,706, Cl. 141-59.000.
McGill, William C., to Union Carbide Corporation. Method for producing R-plane single crystal alpha alumina. 4,224,099, Cl. 156-605.000.
McGraw-Edison Company: *See*—
Urani, Angelo; and Gaia, Aldino J., 4,224,592, Cl. 337-198.000.
McHugh, Dennis P. Agricultural chemical applicator. 4,223,478, Cl. 47-1.500.
McIntosh, Arthur J.: *See*—
Fluent, Stewart L.; and Foley, Dan R., 4,223,674, Cl. 128-217.000.
McIntyre, James A.; and Phillips, Robert F., to Dow Chemical Company, The. Novel oxygen electrode. 4,224,129, Cl. 204-263.000.
McKechnie, John C.: *See*—
Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., 4,223,454, Cl. 35-25.000.
McKinnon, Eugene T.; Drutz, Alvin S.; Nelson, James B., deceased; and Nelson, Lorraine, executrix. Fan motor having reversible rotor. 4,224,544, Cl. 310-90.000.
McLain, Donald E., to Upjohn Company, The. Method and apparatus for electropolishing tablet compressing toolings. 4,224,123, Cl. 204-129.550.
Mead Corporation, The: *See*—
Ziecker, Roger A., 4,223,509, Cl. 53-209.000.
Measurex Corporation: *See*—
Casey, Joseph M.; and Dahlin, Erik B., 4,224,513, Cl. 250-216.000.
Mechanical Technology Incorporated: *See*—
Gray, Stanley, 4,223,958, Cl. 308-9.000.
Medow, Robert S. Spacing means for wall panels. 4,223,490, Cl. 52-98.000.

Mee, John M. L.; Halpern, Berthold; and Korth, John. CI Mass spectrometric analysis of physiologically active compounds. 4,224,031, Cl. 23-230.00B.
Meininger, Fritz: *See—*
Gies, Helmut; and Meininger, Fritz, 4,224,024, Cl. 8-445.000.
Meitzner, Erich F.; and Oline, James A., to Rohm and Haas Company. Polymerization processes and products therefrom. 4,224,415, Cl. 521-38.000.
Menage, Jean-Jacques: *See—*
Perego, Jean-Claude, 4,223,750, Cl. 177-41.000.
Menz, David N. J.: *See—*
Mamers, Heikki; and Menz, David N. J., 4,224,102, Cl. 162-5.000.
Mercer, William R.; Wurst, William C.; and Brodeur, Lester R., to Sanders Associates, Inc. Loran-C cycle detector. 4,224,623, Cl. 343-103.000.
Merck & Co., Inc.: *See—*
Christensen, Burton G.; Guthikonda, Ravindra N.; Johnston, David B. R.; and Schmitt, Susan M., 4,224,336, Cl. 424-274.000.
Jaeger, Arthur; Gunderlock, Richard; and Harwood, Richard J., 4,223,788, Cl. 206-468.000.
Woltersdorf, Otto W., Jr.; and deSolms, Susan J., 4,224,447, Cl. 544-405.000.
Merck, Howard W., to Frito-Lay, Inc. Apparatus and method for selectively ejecting malformed articles. 4,224,350, Cl. 426-473.000.
Meridian Safety Products, Inc.: *See—*
Costello, Michael; and Costello, John E., 4,223,930, Cl. 292-346.000.
Merli, Claudio; and Francia, Carlo, to Euteco S.p.A. Pneumatic tires having ornamented sidewalls, and their manufacture. 4,224,268, Cl. 264-139.000.
Merrill, Richard E.; and Massucco, Arthur A., to Arthur D. Little, Inc. Photocrosslinkable compositions for lithographic printing plates. 4,224,399, Cl. 430-282.000.
Mertens, Ludovicus M.: *See—*
Vermeulen, Leon L.; and Mertens, Ludovicus M., 4,224,402, Cl. 430-517.000.
Meserow, Francis P., to Simpson Electric Company, a Division of American Gage & Machine Company. Engine speed indicator. 4,224,570, Cl. 324-175.000.
Messerschmitt-Bolkow-Blohm GmbH: *See—*
Kranz, Walter, 4,223,770, Cl. 192-0.070.
Messori, Vittorio: *See—*
Baldi, Luciano; Messori, Vittorio; and Francese, Renato, 4,224,444, Cl. 544-204.000.
Metelkin, Oleg A.: *See—*
Dorofeev, Viktor M.; Birjukova, Evelina G.; Andzhaparidze, Otar G.; Metelkin, Oleg A.; Danilov, Evgeny P.; and Geller, Vera I., 4,224,412, Cl. 435-237.000.
Mettler, Stephen C.: *See—*
Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,223,978, Cl. 350-96.200.
Metzger, Karl G.: *See—*
Stadler, Peter; Metzger, Karl G.; Petersen, Uwe; and Voss, Eckart, 4,224,315, Cl. 424-180.000.
Meyer, John H., to R. R. Donnelley & Sons Company. Training aid for registering multi-color printing. 4,223,453, Cl. 35-13.000.
Meyer, Robert J.: *See—*
Glover, Clyde P.; Ferris, James E.; Meyer, Robert J.; and Muka, Edward, 4,224,032, Cl. 23-230.00B.
Meyer, Ronald W.; and Jackman, Robert A., to Tyco Industries, Inc. Blocking toy vehicle. 4,223,476, Cl. 46-257.000.
Meyers, Chester A.; Coy, David H.; and Schally, Andrew V. Somatostatin analogs having a substituted tryptophyl residue in position eight. 4,224,199, Cl. 260-8.000.
Michaud, Claude; and Fontanes, Sylvain, to Thomson-CSF. Analog-digital coder comprising a charge transfer device. 4,224,605, Cl. 340-347.0AD.
Mid-West Conveyor Company, Inc.: *See—*
Lempio, George D., 4,223,610, Cl. 104-172.00S.
Mifune, Hiroyuki: *See—*
Takada, Shunji; Akimura, Yoshitaka; Mifune, Hiroyuki; and Tsujino, Nobuyuki, 4,224,401, Cl. 430-437.000.
Mikhailov, Eduard F.: *See—*
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D., 4,224,291, Cl. 423-178.000.
Mikheeva, Vera I.: *See—*
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.
Miki, Isao; Kido, Takeshi; and Kokubun, Keiichi. Molten metal injection device for die casting machine. 4,223,718, Cl. 164-149.000.
Miller, Anton J., to Bell Telephone Laboratories, Incorporated. Adjusting the frequency of piezoelectric crystal devices via fracturing the crystal surface. 4,224,547, Cl. 310-312.000.
Miller, C. Fredrick. Remote position control method and means. 4,224,559, Cl. 318-601.000.
Miller, Calvin M.: *See—*
Kummer, Raymond B.; Mettler, Stephen C.; and Miller, Calvin M., 4,223,978, Cl. 350-96.200.
Miller, Jimmy L.: *See—*
Goldhaber, Richard P.; Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,224,163, Cl. 210-321.00B.
Miller, Michael J. Anchor for sheet metal screws and the like. 4,223,586, Cl. 85-63.000.
Miller, Viktor A.: *See—*
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.
Milligan, Barton: *See—*
Kunz, Nance D.; Johnson, Thomas A.; and Milligan, Barton, 4,224,249, Cl. 260-580.000.
Milne, George A. Sewage treatment apparatus. 4,224,155, Cl. 210-117.000.
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, to Argus Chemical Corporation. Vinyl chloride polymer stabilizer comprising a metal organophosphonate. 4,224,203, Cl. 260-23.0XA.
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, to Argus Chemical Corporation. Stabilized vinyl chloride polymer comprising a metal mono-organic phosphite. 4,224,218, Cl. 260-45.7PH.
Mine Safety Appliances Company: *See—*
Heckathorne, George E.; and Bub, Robert A., 4,223,626, Cl. 114-221.00A.
Minnesota Mining and Manufacturing Company: *See—*
Hargis, Billy M., 4,224,637, Cl. 357-74.000.
Rude, Harold E.; and Newell, Richard G., 4,224,422, Cl. 525-454.000.
Mirowski, Mieczyslaw: *See—*
Langer, Alois A.; and Mower, Morton M., 4,223,678, Cl. 128-419.00D.
Mitchell, William O.; Hamilton, C. Ray; and Frost, Walter W., to Oxford Industries, Inc. Post form stay inserter for shirt collars. 4,223,815, Cl. 223-2.000.
Mitco Corporation: *See—*
Gorchev, Dimiter; Rodgers, Thomas P.; and Willke, Herbert L., Jr., 4,223,832, Cl. 236-49.000.
Mitsubishi Chemical Industries, Limited: *See—*
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,224,304, Cl. 424-12.000.
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.
Mitsubishi Denki Kabushiki Kaisha: *See—*
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, 4,224,115, Cl. 204-15.000.
Mitsubishi Gas Chemical Company, Inc.: *See—*
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.
Mitter, Mathias. Stencil printer. 4,223,602, Cl. 101-128.210.
Mitterbacher, Paul; Schoning, Josef; and Schwiers, Hans G., to Siempelkamp Giesserei GmbH & Co. KG. High pressure, high-temperature vessel, especially for nuclear reactors. 4,223,496, Cl. 52-224.000.
Miura, Kenichi, to Fujitsu Limited. Parity prediction circuit for adder/-counter. 4,224,680, Cl. 364-738.000.
Miwa, Naotaka: *See—*
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.
Miwa, Nobuo: *See—*
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.
Miyake, Hidekazu: *See—*
Honna, Takaji; Tanaka, Motoaki; Yamada, Syozo; and Miyake, Hidekazu, 4,224,450, Cl. 548-248.000.
Miyasaka, Kiyoshi: *See—*
Mogi, Jun-ichi; Miyasaka, Kiyoshi; and Enomoto, Seiji, 4,224,633, Cl. 357-23.000.
Miyashita, Kiyoshi: *See—*
Tsuda, Hiroshi; and Miyashita, Kiyoshi, 4,223,993, Cl. 355-3.00R.
Miyata, Teruo; Rubin, Albert L.; Dunn, Michael W.; and Stenzel, Kurt H., to Opticol Corporation. Collagen soft contact lens. 4,223,984, Cl. 351-160.00H.
Mizote, Atsunobu: *See—*
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,224,103, Cl. 162-135.000.
Mizuno, Hiroshi; and Kobayashi, Seiichiro, to Honda Giken Kogyo Kabushiki Kaisha. Instrument panel device for cars. 4,223,754, Cl. 180-90.000.
Mizuno, Kinichi: *See—*
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
Mizuno, Toshio: *See—*
Nagano, Masashi; Fujimoto, Hideaki; Mizuno, Toshio; and Egami, Tetufumi, 4,223,562, Cl. 474-82.000.
Mizutani, Norio; and Hamanishi, Yoshinari, to Nippon Kogaku K.K. Telephoto zoom lens. 4,223,981, Cl. 350-184.000.
Mobay Chemical Corporation: *See—*
Heiss, Herbert L., 4,224,431, Cl. 528-48.000.

Mobil Oil Corporation: *See*—
Caldwell, Paul L., Jr.; and Snavely, Earl S., Jr., 4,223,735, Cl. 166-303.000.
Espenscheid, Wilton F., 4,224,079, Cl. 106-274.000.
Foster, C. Mackay, Jr., 4,223,736, Cl. 166-315.000.
Morrison, Roger A.; and Tabak, Samuel A., 4,224,141, Cl. 208-134.000.
Schmitt, Kirk D.; and Bridger, Robert F., 4,224,172, Cl. 252-51.50R.

Modern Controls, Inc.: *See*—
Ayers, Joseph W.; and Wood, Rex C., 4,223,751, Cl. 177-210.00C.

Modular Controls Corporation: *See*—
Kosarzecki, Constantine, 4,223,693, Cl. 137-106.000.

Moench, Theodor P.; and Hanstein, Friedrich, to Rohm GmbH. Multilayered skylight. 4,223,493, Cl. 52-200.000.

Moens, Joris C. E., to N. V. Bekaert S.A. Reinforcing member for castable material and process of mixing reinforcing elements with said material. 4,224,377, Cl. 428-369.000.

Mogi, Jun-ichi; Miyasaka, Kiyoshi; and Enomoto, Seiji, to Fujitsu Limited. IGFET structure with an extended gate electrode end. 4,224,633, Cl. 357-23.000.

Mohan, Narendra, to University of Minnesota, The Regents of the. Composite filter for suppressing harmonic frequencies on electric power transmission lines. 4,224,660, Cl. 363-48.000.

Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., to United States of America, Navy. Marksmanship training system. 4,223,454, Cl. 35-25.000.

Moinard, Jean R.: *See*—
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.

Moitra, Santanu; and Rosskopf, Philip A., to Martin Marietta Corporation. Non-plastic hydraulic cement mixes and process for improving such mixes. 4,224,076, Cl. 106-90.000.

Molins Limited: *See*—
Labbe, Francis A. M., 4,223,685, Cl. 131-109.00R.

Moller, Carl E.: *See*—
Villadsen, John; Livbjerg, Hans; and Moller, Carl E., 4,224,190, Cl. 252-463.000.

Moller, Friedrich: *See*—
Hajek, Manfred; Wagner, Kuno; Moller, Friedrich; and Vehlewald, Peter, 4,224,417, Cl. 521-166.000.

Molvar, Allen E., to Clevepak Corporation. Aeration system and method with tapered nozzle. 4,224,158, Cl. 210-220.000.

Molycorp, Inc.: *See*—
Wilson, William G.; and Kay, D. Alan R., 4,224,058, Cl. 75-58.000.

Momany, Frank A., to Beckman Instruments, Inc. Synthetic peptides having pituitary growth hormone releasing activity. 4,224,316, Cl. 424-177.000.

Monash University: *See*—
Potter, Owen E., 4,224,288, Cl. 423-123.000.

Monsanto Company: *See*—
Ort, Morris R.; and Newell, Elizabeth L., 4,224,264, Cl. 264-54.000.
Papanu, Victor D.; and Upton, Charles J., 4,224,420, Cl. 525-401.000.

Montagner nee Ailloud, Rene: *See*—
Montagner, Rene, 4,223,609, Cl. 104-20.000.

Montagner, Rene, to Montagner nee Ailloud, Rene. Method and installation for loading passengers on a mobile suspended carrier. 4,223,609, Cl. 104-20.000.

Montedison S.p.A.: *See*—
Colle, Roberto; Gozzo, Franco; Camaggi, Giovanni; and Siddi, Giorgio, 4,224,050, Cl. 71-98.000.
Montino, Franco; Corradi, Ariello R.; and Nonato, Erminio, 4,224,175, Cl. 252-62.560.

Montino, Franco; Corradi, Ariello R.; and Nonato, Erminio, to Montedison S.p.A. Process for the preparation of magnetic powders based on γ-Fe_2O_3. 4,224,175, Cl. 252-62.560.

Moog GmbH: *See*—
Handte, Herbert, 4,224,561, Cl. 318-663.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., to International Flavors & Fragrances Inc. Pear flavoring containing a mixture of 2- and 3-cyclotetradecen-1-ones. 4,224,352, Cl. 426-538.000.

Moon, William T., Jr.: *See*—
Bible, Harley V.; and Moon, William T., Jr., 4,223,701, Cl. 137-882.000.

Mooradian, Aram, to Sterling Drug Inc. Tetrahydrocarbazoles and their use. 4,224,335, Cl. 424-274.000.

Morello, Aldo: *See*—
Occhini, Elio; and Morello, Aldo, 4,224,462, Cl. 174-37.000.

Moreno, Carlos M.; and Bridges, Robert D., to Dow Chemical Company, The. Electrolytic diaphragm cell. 4,224,130, Cl. 204-266.000.

Morgunsky, Evgeny I.: *See*—
Sidorenko, Valery A.; Morgunsky, Evgeny I.; Plotnikov, Vladimir A.; Vishnev, Nikolai V.; and Yascheritsyn, Petr I., 4,223,580, Cl. 82-36.00R.

Mori, Fabio Y.: *See*—
de Souza, Marcos H. C.; Barbosa, Celso A.; Falleiros, Ivan G. S.; Mori, Fabio Y.; and Viertler, Werner, 4,224,060, Cl. 75-124.000.

Mori, Fumio: *See*—
Ichinose, Isao; Mori, Fumio; and Kunimoto, Go, 4,224,379, Cl. 428-461.000.

Mori, Mamoru; Sasaki, Shiro; and Kinaga, Eiichi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Seatbelt system. 4,223,917, Cl. 280-806.000.

Mori, Takao: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; Watanabe, Taizo; and Fujimura, Motoki, 4,224,411, Cl. 435-177.000.

Morichika, Toshiaki: *See*—
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, 4,224,061, Cl. 75-125.000.

Morici, Moreno: *See*—
Gazzarrini, Franco; Morici, Moreno; and Trapani, Vittorio, 4,224,040, Cl. 55-71.000.

Morikawa, Naotake: *See*—
Saito, Tomo; Nishiyama, Yumiko; Watanabe, Kazuo; and Morikawa, Naotake, 4,223,448, Cl. 34-4.000.

Morioka, Hajimu: *See*—
Nakamori, Shigeru; Morioka, Hajimu; and Yoshinaga, Fumihiro, 4,224,409, Cl. 435-107.000.

Morledge, Thomas E. Surgical drape support apparatus. 4,223,669, Cl. 128-132.00D.

Morreale, Anthony P., to Rapidsyn Co. Printed circuit terminal for interconnecting stator coils. 4,224,543, Cl. 310-71.000.

Morris, Barbara O.: *See*—
Morris, Bob H.; and Morris, Barbara O., 4,223,804, Cl. 222-3.000.

Morris, Bob H.; and Morris, Barbara O. Personal defense device. 4,223,804, Cl. 222-3.000.

Morris, Glenn H. Push button safety cap for glass bottles. 4,223,794, Cl. 215-220.000.

Morris, Marvin L., to J. I. Case Company. Digging chain support for excavation. 4,223,462, Cl. 37-191.00A.

Morrison, Roger A.; and Tabak, Samuel A., to Mobil Oil Corporation. Manufacture of aromatic compounds. 4,224,141, Cl. 208-134.000.

Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., to Diamond Shamrock Corporation. Antiinflammatory imidazothiazoles and thiazolopyrimidines. 4,224,334, Cl. 424-270.000.

Mosley, William H.; Scott, Lex A.; and Gordy, Robert S., to E-Systems, Inc. Phase/frequency controlled phase shift keyed signal carrier reconstruction circuit. 4,224,575, Cl. 329-50.000.

Motorola, Inc.: *See*—
Glazer, Marvin A., 4,224,537, Cl. 307-310.000.
Hamley, James P., 4,223,656, Cl. 123-598.000.
Loving, Robert O., Jr.; and Kamin, Ralph A., Jr., 4,224,586, Cl. 333-192.000.
Musa, Fuad H.; and Shaw, Pern, 4,224,539, Cl. 307-362.000.
Shaw, Mark L., 4,224,574, Cl. 328-38.000.

Mougin, Georges L., to ITI Limited. Propulsion device for embedding in an iceberg. 4,223,627, Cl. 114-242.000.

Mougin, Louis J.: *See*—
Webb, Ralph L.; and Mougin, Louis J., 4,223,539, Cl. 62-476.000.

Mower, Morton M.: *See*—
Langer, Alois A.; and Mower, Morton M., 4,223,678, Cl. 128-419.00D.

Mueller Co.: *See*—
Humes, Dennis W.; and Daghe, Joseph L., 4,223,868, Cl. 251-326.000.

Mueller, Herbert; Toussaint, Herbert; and Wittwer, Arnold, to BASF Aktiengesellschaft. Preparation of 5-diethylaminopentan-2-ol. 4,224,251, Cl. 260-584.00R.

Mueller, Karl F.; Heiber, Sonia J.; and Plankl, Walter L., to Ciba-Geigy Corporation. Process for preparing hydrogels as spherical beads of large size. 4,224,427, Cl. 526-93.000.

Mueller, Martin S.: *See*—
Carter, William D.; and Mueller, Martin S., 4,223,985, Cl. 352-222.000.

Muenger, James R.: *See*—
Barber, Everett M.; Muenger, James R.; and Alexander, David L., 4,224,299, Cl. 423-360.000.

Muetterties, Andrew J., to Abbott Laboratories. Novel valve employing hydrophobic and hydrophilic membranes. 4,223,695, Cl. 137-173.000.

Muka, Edward: *See*—
Glover, Clyde P.; Ferris, James E.; Meyer, Robert J.; and Muka, Edward, 4,224,032, Cl. 23-230.00B.

Muller, Erich: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,224,322, Cl. 424-246.000.

Muller, Hans, to Chemap AG. Process and a filter for filtering a liquid containing solids having a substantially different specific gravity relative to the liquid. 4,224,153, Cl. 210-780.000.

Muller, Karl: *See*—
Weigel, Horst; and Muller, Karl, 4,223,876, Cl. 266-156.000.

Muller, Uno; and Stutzle, Dietmar, to Diehl. Opto-electronic measuring apparatus, particularly for a projectile detonator. 4,223,607, Cl. 102-213.000.

Munger, Donald W.: *See*—
Lindbom, Torsten H.; and Munger, Donald W., 4,224,501, Cl. 219-124.340.

Muniz, Jose M.: *See*—
Cruickshank, David G.; and Muniz, Jose M., 4,224,500, Cl. 219-121.0LE.

Munstedt, Wolfgang. Smoke alarm station. 4,224,611, Cl. 340-629.000.

Munter, Ernst A.: *See*—
Ciancibello, Carmine A.; and Munter, Ernst A., 4,224,688, Cl. 370-62.000.

Munzer, Manfred: *See*—
Buergle, Peter; Maurer, Karl; Munzer, Manfred; Rosskopp, Wilhelm; and Wenzel, Franz, 4,224,425, Cl. 526-85.000.

Murakami, Shinichi: *See*—
Hiraishi, Hisashi; Morichika, Toshiaki; Murakami, Shinichi; and Akamatsu, Katsutaro, 4,224,061, Cl. 75-125.000.
Muramatsu, Tadao; and Fujiwara, Katsuhiro, to Toyota Jidosha Kogyo Kabushiki Kaisha. Mounting structure for a hub cap or a wheel cap. 4,223,951, Cl. 301-37.0PB.
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, to Ube Industries, Ltd. Regeneration equipment for spent activated carbon. 4,224,286, Cl. 422-205.000.
Murray, Joseph E., Jr. Smoking apparatus with capillary tube pressure balance. 4,223,686, Cl. 131-173.000.
Murray, Robert C., to Valeron Corporation, The. General purpose combined alphanumeric/graphics printer. 4,224,628, Cl. 346-76.0PH.
Musa, Fuad H.; and Shaw, Pern, to Motorola, Inc. FET Voltage level detecting circuit. 4,224,539, Cl. 307-362.000.
Muscanell, Douglas W.: *See*—
Paris, Alfonso A., Jr.; and Muscanell, Douglas W., 4,223,708, Cl. 144-326.00R.
Muto, Rudolph. Endotracheal tube stabilizer. 4,223,671, Cl. 128-200.260.
Muto, Yasuhiko, to Trio Kabushiki Kaisha. Drive circuit for electrostatic deflection type cathode-ray tube. 4,224,556, Cl. 315-396.000.
Mutschler, Gunter: *See*—
Konig, Gunter; Mutschler, Gunter; Scheutle, Erich; and Bucher, Erich, 4,223,519, Cl. 57-291.000.
Muzumdar, Deepak: *See*—
Kaul, Pradman; Gabbard, Ova G.; Muzumdar, Deepak; and Eklof, Anders, 4,224,473, Cl. 370-84.000.
Muzyczko, Thaddeus M.; and Thomas, Daniel C., to Richardson Graphics Company. Photopolymerizable latex systems. 4,224,398, Cl. 430-175.000.
Myklebust, Eirik, to Norsk Hydro A/S. Reinforced flexible container. 4,223,709, Cl. 150-1.000.
N. V. Bekaert S.A.: *See*—
Moens, Joris C. E., 4,224,377, Cl. 428-369.000.
Naefe, Paul: *See*—
Langen, Hans; Naefe, Paul; and Ringel, Helmut, 4,224,258, Cl. 264-0.500.
Nagai, Takuya: *See*—
Niino, Yasukazu; and Nagai, Takuya, 4,223,867, Cl. 251-62.000.
Nagano, Masashi; Fujimoto, Hideaki; Mizuno, Toshio; and Egami, Tetufumi, to Shimano Industrial Company, Limited. Front derailleur for a bicycle. 4,223,562, Cl. 474-82.000.
Nagashima, Takashi: *See*—
Tashiro, Yasuhisa; Nagashima, Takashi; Aoki, Shigeru; and Nishizawa, Rinzo, 4,224,239, Cl. 260-501.110.
Nagata, Shigeyoshi, to Oval Engineering Co., Ltd. Positive displacement flow meter with helical-toothed rotors. 4,224,015, Cl. 418-150.000.
Nagato, Nobuyuki; and Naito, Taketoshi, to Showa Denko K.K. Process for preparing tertiary alkyl isocyanates. 4,224,238, Cl. 260-453.00P.
Naito, Junichiro: *See*—
Okamoto, Kunio; Naito, Junichiro; and Asano, Mitsuru, 4,224,302, Cl. 423-628.000.
Naito, Taketoshi: *See*—
Nagato, Nobuyuki; and Naito, Taketoshi, 4,224,238, Cl. 260-453.00P.
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,223,584, Cl. 84-1.170.
Nakagawa, Hisahide, to Citizen Watch Co., Ltd. Quartz oscillation circuit for electronic timepieces. 4,223,524, Cl. 368-156.000.
Nakagawa, Yunosuke; and Fujii, Kozo, to Kao Soap Company. Polyvinyl alcohol optical brightening composition. 4,224,205, Cl. 260-29.60B.
Nakajima, Fumio: *See*—
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,223,522, Cl. 368-66.000.
Nakamori, Shigeru; Morioka, Hajimu; and Yoshinaga, Fumihiro, to Ajinomoto Company, Incorporated. Method for producing L-proline by fermentation. 4,224,409, Cl. 435-107.000.
Nakamura, Kazuo: *See*—
Jyojiki, Masao; and Nakamura, Kazuo, 4,223,988, Cl. 354-25.000.
Nakamura, Kenichi; Nankai, Shiro; Iijima, Takashi; and Fukuda, Masataro, to Matsushita Electric Industrial Co., Ltd. Enzyme electrode. 4,224,125, Cl. 204-195.00B.
Nakamura, Kenji: *See*—
Mawatari, Akinori; Yamaguchi, Hirohisa; Nakamura, Kenji; and Uchiumi, Satoshi, 4,224,642, Cl. 360-32.000.
Nakamura, Nobuyuki: *See*—
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Nakamura, Tadahiko: *See*—
Nakano, Kenji; and Nakamura, Tadahiko, 4,224,643, Cl. 360-70.000.
Nakane, Toshio: *See*—
Fukunaga, Akio; and Nakane, Toshio, 4,223,531, Cl. 60-400.000.
Nakano, Kenji; and Nakamura, Tadahiko, to Sony Corporation. Automatic tracking servo control system. 4,224,643, Cl. 360-70.000.
Nakano, Sadao: *See*—
Kobayashi, Nobuo; and Nakano, Sadao, 4,223,927, Cl. 292-1.000.
Nakayama, Yasuaki, to Citizen Watch Co., Ltd. Battery construction. 4,224,387, Cl. 429-133.000.
Nakayama, Yasuhiro: *See*—
Toda, Yuzo; Adachi, Keiichi; Ishiguro, Shoji; and Nakayama, Yasuhiro, 4,224,403, Cl. 430-537.000.
Nalco Chemical Company: *See*—
Pardikes, Dennis G.; Flowers, William F.; Huff, Al S.; and Young, Andrew J., 4,224,156, Cl. 210-123.000.
Naletov, Anatoly S.: *See*—
Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S., 4,224,063, Cl. 75-129.000.
Nankai, Shiro: *See*—
Nakamura, Kenichi; Nankai, Shiro; Iijima, Takashi; and Fukuda, Masataro, 4,224,125, Cl. 204-195.00B.
Napadow, Stanley C., to Protectaire Systems Corp. Spray booth with energy saving and fire protection systems. 4,223,599, Cl. 98-115.0SB.
Napoli, Joseph L., Jr.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,224,230, Cl. 260-397.200.
Nara, Aiichiro; Kondo, Hisao; Fujiwara, Takeji; and Ikegawa, Hideaki, to Mitsubishi Denki Kabushiki Kaisha. Process for forming electrode on semiconductor device. 4,224,115, Cl. 204-15.000.
Narr, Berthold: *See*—
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,224,322, Cl. 424-246.000.
National Can Corporation: *See*—
Sauer, Donald G., 4,224,275, Cl. 264-516.000.
National Research Institute for Metals: *See*—
Tachikawa, Kyoji; and Sekine, Hisashi, 4,224,087, Cl. 148-133.000.
National Semiconductor Corporation: *See*—
Campbell, Eugene H., 4,224,569, Cl. 324-78.00D.
Dobkin, Robert C.; Cecil, James B.; and Connolly, Joseph J., Jr., 4,224,564, Cl. 323-74.000.
Natori, Takasi: *See*—
Sasaki, Tadao; Natori, Takasi; and Komaru, Isamu, 4,224,073, Cl. 106-44.000.
Naughton, Francis C.: *See*—
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,224,312, Cl. 424-70.000.
Nauroth, Peter: *See*—
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,224,295, Cl. 423-335.000.
Nava, Pierluigi. Tiltable visor for helmets, in particular motorcyclists helmets and similar. 4,223,410, Cl. 2-424.000.
NCR Corporation: *See*—
Aneshansley, Nicholas E., 4,224,686, Cl. 365-154.000.
Cheng, Charles C. K., 4,224,509, Cl. 235-457.000.
DevChoudhury, Rathindra N., 4,224,614, Cl. 340-707.000.
Neary, Ralph E., to Schlage Lock Company. Doorknob attachment. 4,223,931, Cl. 292-347.000.
Nedwed, Franz H.: *See*—
Buhler, Arthur; and Nedwed, Franz H., 4,224,025, Cl. 8-466.000.
Negi, Virendra S.: *See*—
Peters, Arthur; and Negi, Virendra S., 4,224,668, Cl. 364-200.000.
Neigh, James L.; and Sparber, Richard G., to Bell Telephone Laboratories, Incorporated. Electronic loaded/nonloaded telephone loop identification circuit. 4,224,483, Cl. 179-175.20R.
Nelson, Gunner E., to Ethyl Corporation. Method for preparing 4-hydroxymethyl imidazoles. 4,224,452, Cl. 548-342.000.
Nelson, James B., deceased: *See*—
McKinnon, Eugene T.; Drutz, Alvin S.; Nelson, James B., deceased; and Nelson, Lorraine, executrix, 4,224,544, Cl. 310-90.000.
Nelson, Lorraine, executrix: *See*—
McKinnon, Eugene T.; Drutz, Alvin S.; Nelson, James B., deceased; and Nelson, Lorraine, executrix, 4,224,544, Cl. 310-90.000.
Neuhold, Arnold, to Geimuplast Peter Mundt GmbH & Co. KG. Roll film cartridge. 4,223,852, Cl. 242-71.100.
Neumaier, Hubert, to Hoechst Aktiengesellschaft. Production of halogenomethylphosphinic acid halides. 4,224,241, Cl. 260-543.00P.
New Brunswick Research and Productivity Council: *See*—
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,224,122, Cl. 204-119.000.
New England Log Homes, Inc.: *See*—
Paris, Alfonso A., Jr.; and Muscanell, Douglas W., 4,223,708, Cl. 144-326.00R.
New World Products, Inc.: *See*—
Kent, Jerry B., 4,224,208, Cl. 260-29.60B.
New York Institute of Technology: *See*—
Glenn, William E., 4,223,560, Cl. 73-626.000.
Newell, Elizabeth L.: *See*—
Ort, Morris R.; and Newell, Elizabeth L., 4,224,264, Cl. 264-54.000.
Newell, Richard G.: *See*—
Rude, Harold E.; and Newell, Richard G., 4,224,422, Cl. 525-454.000.
Neyret, Guy, to Societe Anonyme Dite, Etablissements Genoud & Cie. Maximum-flame-height pressure regulator for gas lighter. 4,224,020, Cl. 431-344.000.
NFE International, Ltd.: *See*—
Dupre, George T., 4,224,043, Cl. 55-319.000.
NGK Spark Plug Co., Ltd.: *See*—
Nishio, Kanemitsu; Takagi, Shunichi; and Yoshida, Mitsutaka, 4,224,554, Cl. 315-53.000.
Nicholas, Vincent: *See*—
Dola, Frank P.; and Nicholas, Vincent, 4,223,971, Cl. 339-95.00D.

Nichols, James W.; Lawrence, Rodney G.; and McClure, Lyle D., to Petrolite Corporation. Use of hydrocarbon polymers to improve oil-containing waxes. 4,224,204, Cl. 260-23.00H.

Nichols, John E. Lure retriever. 4,223,465, Cl. 43-17.200.

Nickel, Michael J.: *See—*
Vorsanger, Guy E.; and Nickel, Michael J., 4,223,820, Cl. 224-253.000.

Nickl, Josef: *See—*
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, 4,224,322, Cl. 424-246.000.

Nicolas, Michel: *See—*
Holvoet, Gerard; and Nicolas, Michel, 4,224,588, Cl. 335-152.000.

Nicolson, Ian T.: *See—*
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,224,266, Cl. 264-75.000.

Nieberger, Melvin: *See—*
Robinson, Charles E.; and Nieberger, Melvin, 4,223,649, Cl. 123-319.000.

Niihara, Koichi: *See—*
Hirai, Toshio; and Niihara, Koichi, 4,224,296, Cl. 423-344.000.

Niimi, Koji: *See—*
Kato, Mitsumi; and Niimi, Koji, 4,223,582, Cl. 84-1.010.

Niino, Yasukazu; and Nagai, Takuya, to Nishinippon Engineering Co., Ltd. Valve with a pair of valve plates. 4,223,867, Cl. 251-62.000.

Nikitits, Edwin, to Marcus, Franklyn M. Collapsible table and seat assembly. 4,223,945, Cl. 297-159.000.

Niles Parts Co., Ltd.: *See—*
Kobayashi, Nobuo; and Nakano, Sadao, 4,223,927, Cl. 292-1.000.

Nippon Crucible Co., Ltd.: *See—*
Sasaki, Tadao; Natori, Takasi; and Komaru, Isamu, 4,224,073, Cl. 106-44.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Ida, Masaru, 4,224,691, Cl. 455-159.000.
Iyeta, Motoi, 4,223,624, Cl. 114-144.00E.
Kato, Mitsumi; and Niimi, Koji, 4,223,582, Cl. 84-1.010.
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,223,584, Cl. 84-1.170.
Ogita, Minoru, 4,224,471, Cl. 179-1.0GD.

Nippon Kayaku Kabushiki Kaisha: *See—*
Tashiro, Yasuhisa; Nagashima, Takashi; Aoki, Shigeru; and Nishizawa, Rinzo, 4,224,239, Cl. 260-501.110.

Nippon Kogaku K.K.: *See—*
Mizutani, Norio; and Hamanishi, Yoshinari, 4,223,981, Cl. 350-184.000.

Nippon Kokan Kabushiki Kaisha: *See—*
Higute, Michinosuke; and Yoshikai, Tatsuki, 4,223,628, Cl. 114-246.000.

Nippon Mining Co., Ltd.: *See—*
Fujimori, Kuniaki; Satomi, Yoshihito; Suzuka, Teruo; and Aizawa, Shirou, 4,224,140, Cl. 208-124.000.

Nippon Soken Inc.: *See—*
Okamoto, Kunio; Naito, Junichiro; and Asano, Mitsuru, 4,224,302, Cl. 423-628.000.

Nippon Telegraph and Telephone Public Corporation: *See—*
Izawa, Tatsuo; Kuwabara, Toru; Masuda, Yuichi; and Kameo, Yuji, 4,224,046, Cl. 65-3.00A.

Nippon Tensai Seito Kabushiki Kaisha: *See—*
Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, 4,224,098, Cl. 156-512.000.

Nippon Zeon Co. Ltd.: *See—*
Ueda, Akio; and Akita, Shuichi, 4,224,197, Cl. 260-5.000.

Nishimoto, Keiji; and Tanaka, Shinpei, to Fujitsu Limited. Process for producing a semiconductor device. 4,224,089, Cl. 148-187.000.

Nishinippon Engineering Co., Ltd.: *See—*
Niino, Yasukazu; and Nagai, Takuya, 4,223,867, Cl. 251-62.000.

Nishio, Kanemitsu; Takagi, Shunichi; and Yoshida, Mitsutaka, to NGK Spark Plug Co., Ltd. Spark plug having a low noise level. 4,224,554, Cl. 315-53.000.

Nishiyama, Yumiko: *See—*
Saito, Tomo; Nishiyama, Yumiko; Watanabe, Kazuo; and Morikawa, Naotake, 4,223,448, Cl. 34-4.000.

Nishizawa, Rinzo: *See—*
Tashiro, Yasuhisa; Nagashima, Takashi; Aoki, Shigeru; and Nishizawa, Rinzo, 4,224,239, Cl. 260-501.110.

Nissan Motor Company, Limited: *See—*
Iwanaga, Kazuyoshi, 4,223,768, Cl. 192-4.00A.
Kimura, Shinji; Takao, Hiroshi; Ishitani, Shigeo; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,224,113, Cl. 204-1.00T.
Suzuki, Kazuhiko; and Sone, Masazumi, 4,223,598, Cl. 98-2.110.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,566, Cl. 74-606.00R.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,570, Cl. 74-695.000.
Yanagishima, Takayuki; and Matsumura, Akira, 4,224,609, Cl. 340-576.000.

Nitta, Minoru: *See—*
Kajinaga, Yoshihiro; Nitta, Minoru; Sakurada, Ichio; and Ito, Shunji, 4,223,874, Cl. 266-129.000.

NL Industries, Inc.: *See—*
Brauer, Melvin; Case, Barton C.; and Kroplinski, Thaddeus F., 4,224,164, Cl. 210-321.00B.
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,224,312, Cl. 424-70.000.

Noack, Rolf; Frohlich, Friedhelm; Gramelt, Stefan; and Kmoch, Gerhard, to Deutsche Babcock Aktiengesellschaft. Apparatus for the thermal regeneration of loaded adsorbents. 4,224,041, Cl. 55-208.000.

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Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, to Fuji Photo Film Co., Ltd. 2-Arylnaphtho[1,8-BC]furan-5-ones. 4,224,225, Cl. 260-346.710.

Nohira, Hidetaka; Ito, Sumio; Kumai, Teruo; and Oki, Hisashi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Combustion chamber of an internal combustion engine. 4,223,645, Cl. 123-292.000.

Nolt, Edwin B., to Sperry Corporation. Knot tying mechanism. 4,223,926, Cl. 289-10.000.

Nomura, Takeshi: *See—*
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.

Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, to Citizen Watch Co., Ltd. Electronic timepiece. 4,223,522, Cl. 368-66.000.

Nonato, Erminio: *See—*
Montino, Franco; Corradi, Ariello R.; and Nonato, Erminio, 4,224,175, Cl. 252-62.560.

Noranda Mines Limited: *See—*
Kitzinger, Frank, 4,223,549, Cl. 73-1.00R.

Norsk Hydro A/S: *See—*
Myklebust, Eirik, 4,223,709, Cl. 150-1.000.

Northern Telecom Limited: *See—*
Ciancibello, Carmine A.; and Munter, Ernst A., 4,224,688, Cl. 370-62.000.
Garner, John N., 4,224,090, Cl. 156-48.000.

Northrop Corporation: *See—*
Lynch, Robert T.; and Reis, James J., 4,224,678, Cl. 364-724.000.

Nossen, Edward J.; and Haber, Conrad H., to RCA Corporation. Signal correlation means. 4,224,679, Cl. 364-728.000.

Nowack, Horst: *See—*
Bachmann, Volker; Nowack, Horst; and Trautmann, Karl-Heinz, 4,223,443, Cl. 33-148.00D.

Nowicki, Ludwik. Reflective heat insulating shield, screen, or panel. 4,224,368, Cl. 428-178.000.

Nylund, Kenneth G.; and Lee, Kai Y., to Nylund, Kenneth G. Bean sprout harvester. 4,223,688, Cl. 134-60.000.

Nyquist, Stephen E.: *See—*
Huetsch, Larry C.; Swanson, James P.; and Nyquist, Stephen E., 4,223,766, Cl. 188-112.00R.

Occhini, Elio; and Morello, Aldo, to Industrie Pirelli S.p.A. High voltage, electric submarine cable with insulation of longitudinally varying voltage breakdown strength. 4,224,462, Cl. 174-37.000.

Occidental Oil Shale, Inc.: *See—*
Cha, Chang Y., 4,223,726, Cl. 166-251.000.

O'Connell, Robert M., to United States of America, Air Force. Singly rotated cut of Y-axis boule lead potassium niobate, $Pb_2KNb_5O_{15}$, for surface acoustic wave applications. 4,224,548, Cl. 310-360.000.

O'Connell, Robert M., to United States of America, Air Force. Lead potassium niobate substrate member for surface acoustic wave applications. 4,224,549, Cl. 310-360.000.

Odar, Joseph, to B. F. Goodrich Company, The. Polymerization process for cis-1,4-polybutadiene using cycloalkane solvents and an aromatic polymerization regulator. 4,224,426, Cl. 526-92.000.

Offermanns, Heribert: *See—*
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,224,226, Cl. 260-347.300.

Ogasawara, Shinzi: *See—*
Yukimoto, Kazuyoshi; Ogasawara, Shinzi; Sakamoto, Mitsuhiro; and Kawamura, Yasunori, 4,223,420, Cl. 16-128.100.

Ogden, Dennis H.; and Inverarity, George, to British Industrial Plastics Limited. Resin manufacture. 4,224,423, Cl. 525-515.000.

Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha. FM Radio receiver. 4,224,471, Cl. 179-1.0GD.

Oguri, Yasuo: *See—*
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.

O'Hara, Gary J.: *See—*
Shane, Tim A.; and O'Hara, Gary J., 4,223,893, Cl. 273-237.000.

Oharek, Frank J.: *See—*
Mohon, Windell N.; Oharek, Frank J.; Entwistle, Robert J.; Long, David T.; McKechnie, John C.; and Doty, Don D., 4,223,454, Cl. 35-25.000.

Ohkawa, Motokazu: *See—*
Watanabe, Hiroshi; Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,224,581, Cl. 333-14.000.

Ohloff, Gunther: *See—*
Sundt, Erling; and Ohloff, Gunther, 4,224,351, Cl. 426-535.000.

Ohnishi, Keizo; Adachi, Takao; Fuji, Akiyoshi; and Chiba, Ryuichi, to Japan Steel Works, Inc., The. Method of welding for exfoliation prevention of stai.less steel weld-overlay. 4,224,360, Cl. 427-239.000.

Ohtsuka, Kunio: *See—*
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,566, Cl. 74-606.00R.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, 4,223,570, Cl. 74-695.000.

Oida, Yoshio: *See—*
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,224,685, Cl. 364-900.000.

Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, to Nippon Tensai Seito Kabushiki Kaisha. Apparatus for producing paper tube assembly for nursing seedlings. 4,224,098, Cl. 156-512.000.

Okada, Hitoshi: *See—*
Umezawa, Hiroyuki; Ito, Masao; and Okada, Hitoshi, 4,224,647, Cl. 360-96.300.

Okamoto, Kunio; Naito, Junichiro; and Asano, Mitsuru, to Nippon Soken Inc. Process for producing an alumina catalyst carrier. 4,224,302, Cl. 423-628.000.

Okano, Takeshi: *See—*
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.

Oki, Hisashi: *See—*
Nohira, Hidetaka; Ito, Sumio; Kumai, Teruo; and Oki, Hisashi, 4,223,645, Cl. 123-292.000.

Okubo, Shigeo. Displacement current sensor. 4,224,540, Cl. 307-400.000.

Okubo, Yoshinori. Method for improving the combustion efficiency of hydrocarbon fuel in the internal combustion engine. 4,223,642, Cl. 123-1.00A.

Okuma, Hideo; Takahashi, Takashi; Yamashita, Yohachi; and Furukawa, Osamu, to Tokyo Shibaura Denki Kabushiki Kaisha. Piezoelectric oxide materials. 4,224,174, Cl. 252-62.900.

Okumura, Takatoshi: *See—*
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,223,584, Cl. 84-1.170.

Olander, Harvey F., to Gustafson Mfg. Co. Forward and reverse power control apparatus. 4,223,757, Cl. 180-273.000.

Oldendorph, Oliver F., to General Dynamics. Temperature compensating bearing support. 4,223,959, Cl. 308-15.000.

Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I. Raw mix for the production of portland cement clinker. 4,224,077, Cl. 106-100.000.

Olin Corporation: *See—*
Gill, Jaswant S.; Wood, Joseph L.; and Rachima, Nissim, 4,223,949, Cl. 299-5.000.
Lynch, Richard W., 4,224,290, Cl. 423-158.000.
Tobin, John H.; Gay, Walter A.; and Katz, Lawrence E., 4,224,449, Cl. 548-128.000.
Watson, W. Gary; and Breedis, John F., 4,224,066, Cl. 75-153.000.

Oline, James A.: *See—*
Meitzner, Erich F.; and Oline, James A., 4,224,415, Cl. 521-38.000.

Olivieri, Icaro, to Iceslj A.G. Blade for ice skates. 4,223,900, Cl. 280-11.120.

Ollivier, Christian: *See—*
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,224,094, Cl. 156-169.000.

Olsen, Axel. Electrical terminal clamp for the establishment of an electrically conducting connection. 4,223,972, Cl. 339-97.00R.

Olson, Daniel R.: *See—*
Schroeter, Siegfried H.; and Olson, Daniel R., 4,224,378, Cl. 428-412.000.

Olson, John E., to Cascade Corporation. Light assembly for positioning lift truck load-handling device. 4,224,657, Cl. 362-67.000.

Olszewski, Walter J.; and Ziemer, John H., to Union Carbide Corporation. Cryogenic system for producing low-purity oxygen. 4,224,045, Cl. 62-30.000.

Olympian Stone Company, Inc.: *See—*
Robinson, Ralph C., 4,223,502, Cl. 52-315.000.

Olympus Optical Co., Ltd.: *See—*
Fujiwara, Toshihide, 4,224,529, Cl. 307-127.000.
Hayamizu, Yoshisada, 4,223,989, Cl. 354-59.000.
Hijikata, Kazuo, 4,224,405, Cl. 435-3.000.
Tsuda, Hiroshi; and Miyashita, Kiyoshi, 4,223,993, Cl. 355-3.00R.

Onda, Takanori, to Honda Giken Kogyo Kabushiki Kaisha. Power transmission apparatus. 4,223,567, Cl. 74-606.00R.

Onisko, Bruce L.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,224,230, Cl. 260-397.200.

Ono, Hisatake: *See—*
Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, 4,224,225, Cl. 260-346.710.

Ono Pharmaceutical Co., Ltd.: *See—*
Fujii, Setsuro; Watanabe, Tsuyoshi; Shiota, Masashi; Itsuo, Okumoto; and Kayama, Naohiro, 4,224,342, Cl. 424-310.000.

Onopchenko, Anatoli; and Schulz, Johann G. D., to Gulf Research & Development Company. Production of carboxylic acids from olefins and mixtures of olefins. 4,224,232, Cl. 260-413.000.

Opal, Kenneth E.: *See—*
Maiese, John J.; and Opal, Kenneth E., 4,224,663, Cl. 363-144.000.

Opticol Corporation: *See—*
Miyata, Teruo; Rubin, Albert L.; Dunn, Michael W.; and Stenzel, Kurt H., 4,223,984, Cl. 351-160.00H.

Orega Circuits et Communication: *See—*
Holvoet, Gerard; and Nicolas, Michel, 4,224,588, Cl. 335-152.000.

O'Reilly, Dale. Method for well operations. 4,223,737, Cl. 166-362.000.

Orogil: *See—*
Rivier, Georges; and Forat, Gerard, 4,224,171, Cl. 252-46.700.

O'Rourke, Richard G.: *See—*
Knibb, Terence F.; and O'Rourke, Richard G., 4,224,116, Cl. 204-15.000.

Ort, Morris R.; and Newell, Elizabeth L., to Monsanto Company. Foam crystallization of condensation polymers. 4,224,264, Cl. 264-54.000.

Ortelli, Aurelio, to Riva Calzoni S.p.A. Device for coupling the pistons to the rotor in a radial-piston hydraulic motor. 4,223,595, Cl. 92-72.000.

Osborne, Richard F., to W. R. Grace & Co. Laser sealing of thermoplastic material. 4,224,096, Cl. 156-380.000.

Ostrowski, Joseph F. Vehicle reaction signal. 4,224,598, Cl. 340-66.000.

Ostrowski, Richard C., to Caterpillar Tractor Co. Method of making and using a ceramic shell mold. 4,223,716, Cl. 164-26.000.

Oswin, Harry G. Nickel-oxide electrode structure and method of making same. 4,224,392, Cl. 429-206.000.

Otisca Industries, Ltd.: *See—*
Smith, Clay D.; and Keller, Douglas V., Jr., 4,224,039, Cl. 44-10.00R.

Otsuka Chemical Co. Ltd.: *See—*
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,224,103, Cl. 162-135.000.

Outboard Marine Corporation: *See—*
Winston, John H., 4,223,937, Cl. 294-103.00R.

Outcalt, Mark C.: *See—*
Denney, Jerry W.; and Outcalt, Mark C., 4,224,034, Cl. 23-230.00B.

Oval Engineering Co., Ltd.: *See—*
Nagata, Shigeyoshi, 4,224,015, Cl. 418-150.000.

Owens-Corning Fiberglas Corporation: *See—*
Froberg, M. Laird, 4,224,459, Cl. 13-6.000.
Marzocchi, Alfred, 4,224,373, Cl. 428-288.000.

Owens-Illinois, Inc.: *See—*
Kontz, Robert F., 4,223,778, Cl. 198-389.000.
Kontz, Robert F., 4,224,263, Cl. 264-25.000.
McColl, Bruce J., 4,223,904, Cl. 280-104.000.
Taylor, Lynn J.; and Tobias, John W., 4,224,416, Cl. 521-94.000.

Oxford Hill, Ltd.: *See—*
Thiele, Geraldine H.; and Yankell, Samuel L., 4,224,307, Cl. 424-49.000.

Oxford Industries, Inc.: *See—*
Mitchell, William O.; Hamilton, C. Ray; and Frost, Walter W., 4,223,815, Cl. 223-2.000.

Oya, Akiyoshi: *See—*
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,223,584, Cl. 84-1.170.

Oya, Masayuki: *See—*
Iwao, Jun-ichi; Oya, Masayuki; Kato, Eishin; and Watanabe, Toshio, 4,224,457, Cl. 562-401.000.

Ozaki, Kiyoji: *See—*
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.

Ozawa Concrete Industry Co., Ltd.: *See—*
Ozawa, Seiichi, 4,224,274, Cl. 264-333.000.

Ozawa, Seiichi, to Ozawa Concrete Industry Co., Ltd. Method for manufacture of concrete products. 4,224,274, Cl. 264-333.000.

Ozawa, Takashi: *See—*
Takenouchi, Mutsuo; and Ozawa, Takashi, 4,224,510, Cl. 250-207.000.

P. R. Mallory & Co. Inc.: *See—*
Ciliberti, Frank L., Jr.; and Kaye, Gordon E., 4,224,385, Cl. 429-66.000.

Pacesetter Systems, Inc.: *See—*
Schulman, Joseph H.; Mann, Brian M.; and Beane, Russell R., 4,223,679, Cl. 128-419.0PT.

Page, Edward J. Storm window. 4,223,481, Cl. 49-63.000.

Pagnozzi, Ernesto G.; and Pagnozzi, Vincenzo. Method for drying timber. 4,223,451, Cl. 34-16.500.

Pagnozzi, Vincenzo: *See—*
Pagnozzi, Ernesto G.; and Pagnozzi, Vincenzo, 4,223,451, Cl. 34-16.500.

Palandrani, Joseph, to American Metal Forming Company. Wall cabinet. 4,223,965, Cl. 312-100.000.

Pankove, Jacques I., to RCA Corporation. Method and structure for passivating a semiconductor device. 4,224,084, Cl. 148-1.500.

Papanu, Victor D.; and Upton, Charles J., to Monsanto Company. Preparation of polymeric acetal carboxylates using molecular sieves. 4,224,420, Cl. 525-401.000.

Pape, Karl, to Volkswagenwerk Aktiengesellschaft. Flexible pipe connection. 4,223,922, Cl. 285-39.000.

Papuchon, Michel; and Puech, Claude, to Thomson-CSF. Integrated optical demultiplexing circuit. 4,223,977, Cl. 350-96.110.

Paradis, Rene H.: *See—*
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,223,720, Cl. 165-14.000.

Pardikes, Dennis G.; Flowers, William F.; Huff, Al S.; and Young, Andrew J., to Nalco Chemical Company. Weir skimmer. 4,224,156, Cl. 210-123.000.

Paris, Alfonso A., Jr.; and Muscanell, Douglas W., to New England Log Homes, Inc. Double mortise cutter and method of using same. 4,223,708, Cl. 144-326.00R.

Park Mobile, Inc.: *See—*
Evans, Edward N., 4,224,624, Cl. 343-112.00R.

Parker-Hannifin Corporation: *See—*
Reinicke, Robert H., 4,223,698, Cl. 137-595.000.

Parker, Ralph L.: *See—*
Stanton, Arthur J.; Raney, Meredith T.; and Parker, Ralph L., 4,223,994, Cl. 355-28.000.

Parks, Harold G., to General Electric Company. Magnetic fine deflection system comprising sheet conductors. 4,224,552, Cl. 313-431.000.

Pascarella, Vincent J.: *See*—
McDowell, John R.; Howard, Dennis D.; and Pascarella, Vincent J., 4,224,454, Cl. 560-12.000.

Patel, Dilipkumar B.: *See*—
Lese, Gregory; Liebler, Charles F.; and Patel, Dilipkumar B., 4,224,482, Cl. 179-157.000.

Patel, Pravin K.; Johnston, David H.; and Makaeff, John, deceased (by Makaeff, Madeleine, legal representative), to Poly Disc Systems, Inc. Abrasion resistant magnetic record members. 4,224,381, Cl. 428-652.000.

Patterson, William W., III; and Grapes, Eugene F. Load binder apparatus. 4,223,869, Cl. 24-68.0CD.

Patton, James J. Waterborne life-saving apparatus. 4,223,415, Cl. 9-14.000.

Patton, John S., to Ethyl Corporation. Child resistant closure 4,223,793, Cl. 215-220.000.

Pawloski, Chester E., to Dow Chemical Company, The. 3,5,6-Trifluoro-2-pyridinyl phosphorus compounds. 4,224,318, Cl. 424-200.000.

Paymal, Andre, to Saint-Gobain Industries. Apparatus for supporting solar collectors on a building. 4,223,667, Cl. 126-450.000.

Payton, Joy T.: *See*—
Bodor, Edward E.; and Payton, Joy T., 4,223,733, Cl. 166-293.000.

Pears, Gordon E. A., to Imperial Chemical Industries Limited. Coated polyester films. 4,224,270, Cl. 264-171.000.

Pearson, Arthur E., to British Steel Corporation. Gas storage systems. 4,223,803, Cl. 222-3.000.

Pechhold, Engelbert; and Robinson, Ivan M., to Du Pont de Nemours, E. I., and Company. Polyurethanes prepared with tetrahydrofuran-alkylene oxide polymerizates having low oligomeric cyclic ether content. 4,224,432, Cl. 528-76.000.

Pedrini, Ivano. Device for quickly washing kitchenware, glasses, pots and the like. 4,223,418, Cl. 15-28.000.

Pegg, David R., to Garrett Energy Research & Engineering Inc. Method of oil recovery from underground reservoirs. 4,223,728, Cl. 166-266.000.

Peirish, Alfred J., Jr.; and Knepshield, Robert E., to International Telephone and Telegraph Corporation. Visual warning apparatus for emergency vehicles. 4,224,599, Cl. 340-84.000.

Peled, Emanuel, to Ramot University Authority for Applied Research and Industrial Development Ltd. Non-aqueous primary cell. 4,224,389, Cl. 429-194.000.

Pemberton, Mark S.; and Crawford, Steven D., to University of Arkansas Foundation. Method for ethanol fermentation. 4,224,410, Cl. 435-162.000.

Pemco-Kalamazoo, Inc.: *See*—
Black, John W., 4,223,511, Cl. 53-390.000.

Pendergast, Edward B., to Products by Hector, Incorporated. Osmotic fertilizer product and fertilization method. 4,224,048, Cl. 71-11.000.

Pendleton, Jack G., to Judd Valve Company, Inc. Check valve. 4,223,697, Cl. 137-527.800.

Pennwalt Corporation: *See*—
Cheung, Peter P. L., 4,224,023, Cl. 433-216.000.

Penny, Thomas D.: *See*—
Dunn, Edward C., Jr.; Hickman, Louis S.; and Penny, Thomas D., 4,223,883, Cl. 271-11.000.

Pentagon Industries, Inc.: *See*—
Briedis, Juozas, 4,223,855, Cl. 242-204.000.

Penz, Perry A., to Texas Instruments Incorporated. Method of using a liquid crystal display device as a data input device. 4,224,615, Cl. 340-712.000.

Peralta, Eduardo J., to Ford Aerospace & Communications Corp. Highly sensitive non-refrigerated radiation sensor. 4,224,512, Cl. 250-215.000.

Perego, Jean-Claude, to Menage, Jean-Jacques; and Le Bars, Francois, part interest to each. Weighting instrument for dietetic use. 4,223,750, Cl. 177-41.000.

Peregudov, Lev V.; Malashin, Mikhail M.; Naletov, Anatoly S.; and Martynets, Nikolai S. Method of using iron modifier. 4,224,063, Cl. 75-129.000.

Peretz, Maurice M.; and Haimovich, Yhiel, to Elbit Computers Ltd. Antenna. 4,224,625, Cl. 343-750.000.

Perfection Automotive Products Corporation: *See*—
Bloom, Stephen R., 4,223,983, Cl. 350-303.000.

Perkin-Elmer Corporation, The: *See*—
Sellner, Harvey R., 4,224,600, Cl. 340-146.3MA.

Perkinson, William B.; and Zies, Ray K., to Bell Telephone Laboratories, Incorporated. Arrangement for translating telephone station equipment numbers into directory numbers. 4,224,477, Cl. 179-18.0ET.

Pernick, David. Method of knitting and of processing high pile fabric. 4,223,427, Cl. 28-159.000.

Perreault, Henri. Acoustic micrometer. 4,223,444, Cl. 33-166.000.

Perry, Landis H. Recreational vehicle safety system. 4,223,692, Cl. 137-78.400.

Persons, Charles, II; and Harst, Robb, to Persons-Majestic Manufacturing Company. Combination cycle seat-skateboard. 4,223,905, Cl. 280-289.00R.

Persons-Majestic Manufacturing Company: *See*—
Persons, Charles, II; and Harst, Robb, 4,223,905, Cl. 280-289.00R.

Persson, Leif A. T.; and Lundin, Tord P. Headset with limiter circuit. 4,224,470, Cl. 179-1.0VL.

Peter, Emil. Prestressed steel support structure and method of erecting the same. 4,223,495, Cl. 52-223.00R.

Peters, Albert: *See*—
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,224,295, Cl. 423-335.000.

Peters, Arthur; and Negi, Virendra S., to Honeywell Information Systems Inc. Control store address generation logic for a data processing system. 4,224,668, Cl. 364-200.000.

Petersen, Richard E.: *See*—
Veiga, Manuel J.; and Petersen, Richard E., 4,224,375, Cl. 428-315.000.

Petersen, Uwe: *See*—
Stadler, Peter; Metzger, Karl G.; Petersen, Uwe; and Voss, Eckart, 4,224,315, Cl. 424-180.000.

Petersen, Walter J., to Toro Company, The. Brake clutch. 4,223,771, Cl. 192-10.000.

Petri, Norbert: *See*—
Sauer, Wolfgang; Fliege, Werner; Dudeck, Christian; and Petri, Norbert, 4,224,254, Cl. 568-431.000.

Petrolite Corporation: *See*—
Buriks, Rudolf S.; Fauke, Allen R.; and Griffiths, David W., 4,224,150, Cl. 210-735.000.
Nichols, James W.; Lawrence, Rodney G.; and McClure, Lyle D., 4,224,204, Cl. 260-23.00H.

Pez, Guido P.: *See*—
Grey, Roger A.; and Pez, Guido P., 4,224,458, Cl. 585-266.000.

Pfarrwaller, Erwin, to Sulzer Brothers Limited. Picking mechanism for a shuttle of a weaving machine. 4,223,703, Cl. 139-145.000.

Pfister, Rudolf: *See*—
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,224,445, Cl. 544-212.000.

Pfisterer, Hans-Peter. Tank, particularly oil tank. 4,224,265, Cl. 264-71.000.

Pfizer Inc.: *See*—
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, 4,224,314, Cl. 424-122.000.
Welch, Willard M., Jr., 4,224,329, Cl. 424-256.000.

Pharmindustrie: *See*—
Gueremy, Claude G. A.; Hodac, Francoise; and Renault, Christian L. A., 4,224,332, Cl. 424-267.000.

Phelps Dodge Industries, Inc.: *See*—
Sollner, George H., 4,224,206, Cl. 260-29.20N.

Philagro, service Brevets: *See*—
Clapot, Claude; Dumont, Louis; and Vial, Jean, 4,224,051, Cl. 71-98.000.

Philip Morris Incorporated: *See*—
Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,497, Cl. 219-121.0LM.
Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,498, Cl. 219-121.00L.

Phillips, David C.; and Garbuny, Max, to Westinghouse Electric Corp. Apparatus for producing stereo-regular polymers. 4,224,525, Cl. 250-531.000.

Phillips, John: *See*—
Viza, Dimitri; Adamopoulos, Dimitri; and Phillips, John, 4,224,404, Cl. 435-2.000.

Phillips Petroleum Company: *See*—
Benedict, Bruce C., 4,224,142, Cl. 208-179.000.
Cheng, Paul J., 4,224,284, Cl. 422-156.000.
Childs, William V., 4,224,112, Cl. 203-18.000.
Doss, Richard C., 4,224,436, Cl. 528-275.000.
Lamb, Charles M., III, 4,224,200, Cl. 260-18.00R.
Potts, Mack F., 4,224,283, Cl. 422-111.000.
Schiff, Sidney, 4,224,139, Cl. 208-18.000.
Vanderveen, John W.; and Malick, Emil A., 4,224,414, Cl. 435-313.000.

Phillips, Raymond J., to Alexander Shand Services Limited. Apparatus for deskulling tundishes and similar vessels. 4,223,875, Cl. 266-135.000.

Phillips, Robert F.: *See*—
McIntyre, James A.; and Phillips, Robert F., 4,224,129, Cl. 204-263.000.

Photon Power, Inc.: *See*—
Lampkin, Curtis M.; Roderick, Guy A.; and Locke, Peter, 4,224,355, Cl. 427-8.000.

Pickus, Milton R.: *See*—
Wang, John L.; Pickus, Milton R.; and Douglas, Kent E., 4,223,434, Cl. 29-599.000.

Pierce Corporation: *See*—
Bleakney, Robert W., 4,223,839, Cl. 239-177.000.

Pierobon, Giampaolo: *See*—
Fricker, Paul; Vogler, Gottfried; Knecht, Hans-Rudolf; Pierobon, Giampaolo; Schumacher, Bernd; and Zimmerman, Arnold, 4,224,495, Cl. 219-69.00V.

Pieters, Wim J. M.; and Wenger, Franz, to Allied Chemical Corporation. Removal of low concentrations of hydrogen from chlorine gas. 4,224,293, Cl. 423-248.000.

Pike, LeRoy: *See*—
Baird, William G., Jr.; and Pike, LeRoy, 4,224,262, Cl. 264-22.000.

Pilgrim, Thomas A., to BPB Industries Limited. Treatment of gypsum plaster. 4,224,078, Cl. 106-110.000.

Pilwat, Gunter: *See*—
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann-Josef, 4,224,313, Cl. 424-94.000.

Pinkerman, John P. Portable checkbook-balance calculating device. 4,224,675, Cl. 364-705.000.

Piper, John: *See—*
DeMatos, Henrique V.; and Piper, John, 4,224,656, Cl. 361-433.000.

Pischikov, Sergei I.: *See—*
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M., 4,224,661, Cl. 363-71.000.

Pischikov, Vsevolod I.: *See—*
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M., 4,224,661, Cl. 363-71.000.

Piter, Hans; and Serapins, Klaus, to Felten & Guilleaume Carlswerk AG. Arrangement for alignedly coupling two coated light-conductive fibers. 4,223,979, Cl. 350-96.210.

Pitney Bowes Inc.: *See—*
Coppola, Vincent G.; Grisgraber, Edwin G.; and Lorenzo, John L., 4,224,506, Cl. 235-92.0FP.

Plankl, Walter L.: *See—*
Mueller, Karl F.; Heiber, Sonia J.; and Plankl, Walter L., 4,224,427, Cl. 526-93.000.

Plastilite Corporation: *See—*
Taggart, John K., 4,223,791, Cl. 211-120.000.

Plessey Handel und Investments AG: *See—*
Knibb, Terence F.; and O'Rourke, Richard G., 4,224,116, Cl. 204-15.000.

Plotnikov, Vladimir A.: *See—*
Sidorenko, Valery A.; Morgunsky, Evgeny I.; Plotnikov, Vladimir A.; Vishnev, Nikolai V.; and Yascheritsyn, Petr I., 4,223,580, Cl. 82-36.00R.

Poad, Clarke M. Sailing indicator. 4,223,631, Cl. 116-265.000.

Poinsett Machine Works, Inc.: *See—*
Whitted, Robert L.; and Simmons, James E., 4,223,520, Cl. 57-350.000.

Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., to Societe pour l'Equipement de Vehicules; and Societe Anonyme Francaise du Ferodo. Vehicle air conditioning device. 4,223,720, Cl. 165-14.000.

Poirier, J. Leon; Rao, Kotcherlakota V. N.; and Poles, Livio D., to United States of America, Air Force. Intruder detector system having improved uniformity of detection sensitivity. 4,224,607, Cl. 340-552.000.

Polaroid Corporation: *See—*
Hardy, Herbert L., 4,224,563, Cl. 323-225.00C.

Poles, Livio D.: *See—*
Poirier, J. Leon; Rao, Kotcherlakota V. N.; and Poles, Livio D., 4,224,607, Cl. 340-552.000.

Polgari, Istvan: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Poli Industria Chimica S.p.A.: *See—*
Massaroli, Giangiacomo, 4,224,327, Cl. 424-251.000.

Poliker, Boris E.; Georgievsky, Georgy M.; Kotov, Anatoly A.; Kozyrev, Sergei P.; Markelov, Nikolai N.; Chukhchin, Nikolai F.; Kalinin, Eduard A.; Dmitrichenko, Sergei S.; Ishanov, Alexandr P.; Kashuba, Boris P.; and Levitanus, Adolf D. Steering system for vehicle trains. 4,223,908, Cl. 280-419.000.

Pollet, Jean-Claude, to Xerox Corporation. Magnetic toner materials containing quaternary ammonium polymers as charge control agents. 4,224,396, Cl. 430-107.000.

Polley, Richard B. Lifting device for railway tank car. 4,223,612, Cl. 105-1.00R.

Poly Disc Systems, Inc.: *See—*
Patel, Pravin K.; Johnston, David H.; and Makaeff, John, deceased, 4,224,381, Cl. 428-652.000.

Polyakov, Jury A.: *See—*
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D., 4,224,291, Cl. 423-178.000.

Pope, Kenneth E., to Combustion Engineering, Inc. Electrostatic coalescing system. 4,224,124, Cl. 204-186.000.

Post, Lothar, to Rheinmetall GmbH. Double-feed sprocket arrangement for munition changing in automatic guns. 4,223,589, Cl. 89-33.0SF.

Postovalov, Valdis E.: *See—*
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.

Potter, Owen E., to Monash University. Alumina production. 4,224,288, Cl. 423-123.000.

Potter, Timothy K.; and Lopez Gomez, Raimundo, to Gotaverken Aluminium AB. Wall system. 4,223,504, Cl. 52-479.000.

Potts, Mack F., to Phillips Petroleum Company. Purification of hydrocarbons. 4,224,283, Cl. 422-111.000.

Powdrex Limited: *See—*
Dain, Richard J.; and Brewin, Peter R., 4,224,260, Cl. 264-11.000.

Powell, Brian W., to Ferranti Limited. Speed control. 4,224,545, Cl. 310-93.000.

Powell, Jimmie L.; and Tummala, Rao R., to International Business Machines Corporation. Seal glass for nozzle assemblies of an ink jet printer. 4,224,627, Cl. 346-75.000.

Powell, P. Ray. Anti-jackknifing method and apparatus. 4,223,767, Cl. 188-112.00A.

Power Control Corporation: *See—*
Maiese, John J.; and Opal, Kenneth E., 4,224,663, Cl. 363-144.000.

Power-Lite Industries, Inc.: *See—*
Taylor, Stephen, 4,224,383, Cl. 429-7.000.

Powers, Edward J., to Stauffer Chemical Company. Preparation of sodium orthophosphate mixtures. 4,224,294, Cl. 423-309.000.

Powers, Larry J.: *See—*
Moser, Robert E.; Powers, Larry J.; and Ariyan, Zaven S., 4,224,334, Cl. 424-270.000.

Pozniak, Donald J.; and Herrin, Ronald J., to General Motors Corporation. Hydraulic valve lifter. 4,223,648, Cl. 123-90.160.

PPG Industries Canada Ltd.: *See—*
Geesen, Donald H., 4,224,035, Cl. 23-296.000.
Geesen, Donald H., 4,224,036, Cl. 23-296.000.
Geesen, Donald H., 4,224,037, Cl. 23-296.000.

PPG Industries, Inc.: *See—*
Walton, Richard J., 4,224,128, Cl. 204-243.00R.

Prest, John D. Convertible stand for table tops. 4,223,860, Cl. 248-171.000.

Pretzsch, Siegfried. Contact switch arrangement. 4,224,493, Cl. 200-292.000.

Priepke, Edward H.; and Wagstaff, Robert A., to Sperry Corporation. Forage harvester. 4,223,846, Cl. 241-60.000.

Priest, David C., to Reeves Brothers, Inc. Polyether-derived polyurethane foam impregnant and method of application. 4,224,374, Cl. 428-310.000.

Pritchard, Dalton H.; Sepp, Walter E.; and Lagoni, William A., to RCA Corporation. Frequency multiplier for use with CCD comb filter. 4,224,638, Cl. 358-31.000.

Products by Hector, Incorporated: *See—*
Pendergast, Edward B., 4,224,048, Cl. 71-11.000.

Prokhorov, Alexandr M.: *See—*
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.

Proksch, Gary J.; and Bonderman, Dean P. Compound useful in cholesterol assay procedures. 4,224,229, Cl. 260-397.200.

Promotora de Tecnologia Industrial, S.A.: *See—*
Retana, Alfonso G., 4,224,169, Cl. 252-8.100.

Protectaire Systems Corp.: *See—*
Napadow, Stanley C., 4,223,599, Cl. 98-115.0SB.

Pshenichkin, Petr A.: *See—*
Glodin, Jury N.; Eliseenko, Albert G.; Pshenichkin, Petr A.; Smirnov, Evgeny A.; Khavsky, Nikolai N.; and Kuznetsov, Lev B., 4,223,963, Cl. 308-188.000.

Psota, Joseph M.: *See—*
Mahaffy, Reid A.; Psota, Joseph M.; and Giordano, John A., 4,223,513, Cl. 53-432.000.

Puech, Claude: *See—*
Papuchon, Michel; and Puech, Claude, 4,223,977, Cl. 350-96.110.

Punwani, Dharamvir: *See—*
Bodle, William W.; and Punwani, Dharamvir, 4,223,449, Cl. 34-9.000.

Puretic, Mario J. Outboard thruster for boats. 4,223,625, Cl. 114-147.000.

Quemerais, Philippe; and Veron, Jean, to Regie Nationale des Usines Renault. Transmission with epicycloidal train. 4,223,571, Cl. 74-759.000.

Quick, Leonard M.: *See—*
Hensley, Albert L., Jr.; Quick, Leonard M.; and Hopkins, P. Donald, 4,224,144, Cl. 208-216.0PP.

Quinby, James D. Alarm device for drainage pouch. 4,224,610, Cl. 340-614.000.

Quinn, Clayton B.; and Wilson, Charles A., II, to General Electric Company. Continuous process for producing halogenated polycarbonates and the polycarbonates obtained therefrom. 4,224,434, Cl. 528-199.000.

R. Alkan & Cie: *See—*
Duclos, Didier A.; and Coutin, Pierre F., 4,223,763, Cl. 188-1.00C.

R.K.S.: *See—*
Martinez, Joachim, 4,223,961, Cl. 308-174.000.

R. R. Donnelley & Sons Company: *See—*
Meyer, John H., 4,223,453, Cl. 35-13.000.

Rabe, Lester H.: *See—*
Williams, John E.; and Rabe, Lester H., 4,223,808, Cl. 222-88.000.

Rachima, Nissim: *See—*
Gill, Jaswant S.; Wood, Joseph L.; and Rachima, Nissim, 4,223,949, Cl. 299-5.000.

Rajakovics, Gundolf E. Apparatus for the purpose of avoiding pressure drop between a gaseous or vaporous phase and a liquid phase. 4,223,696, Cl. 137-206.000.

Raksis, Joseph W.: *See—*
Dennis, Kent S.; and Raksis, Joseph W., 4,224,217, Cl. 260-45.70R.

Ramot University Authority for Applied Research and Industrial Development Ltd.: *See—*
Peled, Emanuel, 4,224,389, Cl. 429-194.000.

Ramsauer, Larry R. Method of enhancing an embossed translucent flexible sheet material. 4,224,362, Cl. 427-265.000.

Ranco Incorporated: *See—*
Rossi, Guglielmo, 4,224,488, Cl. 200-67.00A.

Raney, Meredith T.: *See—*
Stanton, Arthur J.; Raney, Meredith T.; and Parker, Ralph L., 4,223,994, Cl. 355-28.000.

Rao, Kotcherlakota V. N.: *See—*
Poirier, J. Leon; Rao, Kotcherlakota V. N.; and Poles, Livio D., 4,224,607, Cl. 340-552.000.

Rapid Mounting & Finishing Company: *See*—
Schoenung, Alois F., 4,223,488, Cl. 52-39.000.
Rapidsyn Co.: *See*—
Morreale, Anthony P., 4,224,543, Cl. 310-71.000.
Rapistan Incorporated: *See*—
Saur, Charles W., 4,223,780, Cl. 198-781.000.
Raymond, Stephen A.: *See*—
Schoendorfer, Donald W.; and Raymond, Stephen A., 4,223,411, Cl. 3-1.300.
Raynal, Serge F.: *See*—
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.
Rayner, Basil M.; and Evans, David C., to Beachcroft Concrete Partitions Limited. Tools. 4,223,935, Cl. 294-16.000.
Raypak Produkten B.V.: *See*—
Widdershoven, Louis H., 4,223,641, Cl. 122-448.00R.
Raytheon Company: *See*—
Larkin, Stephen J., 4,224,583, Cl. 333-100.000.
Vickery, Earl C.; Schmoock, James C.; and Brown, Clyde M., Jr., 4,224,631, Cl. 357-13.000.
RCA Corporation: *See*—
Cutsogeorge, George A., 4,224,536, Cl. 307-297.000.
Nossen, Edward J.; and Haber, Conrad H., 4,224,679, Cl. 364-728.000.
Pankove, Jacques I., 4,224,084, Cl. 148-1.500.
Pritchard, Dalton H.; Sepp, Walter E.; and Lagoni, William A., 4,224,638, Cl. 358-31.000.
Reade, Richard F., to Corning Glass Works. Non-toxic frits for decorating glass, glass-ceramic and ceramic articles. 4,224,074, Cl. 106-48.000.
Reboux, Jean; and Guilloteau, Joel, to Tocco-Stel. Brazing press for brazing claddings to pressings including a flat bottom surrounded by curved portions. 4,224,494, Cl. 219-9.500.
Recognition Equipment Incorporated: *See*—
Kao, Charles T., 4,224,508, Cl. 235-437.000.
Reed, Edwin A.: *See*—
Marlett, Calvin J.; Reed, Edwin A.; Johnson, Richard C.; and Hug, William F., 4,224,579, Cl. 331-94.50G.
Reed, John W.: *See*—
Lewis, David O.; Reed, John W.; and Wallin, Gary W., 4,224,667, Cl. 364-200.000.
Reeder, Andries T.: *See*—
Gijzel, Jacobus M.; and Reeder, Andries T., 4,224,503, Cl. 219-308.000.
Reedy, Lonnie T.; and Smith, Eddie, to Reedy and Smith, Inc. Automatic transmission. 4,223,960, Cl. 308-78.000.
Reedy and Smith, Inc.: *See*—
Reedy, Lonnie T.; and Smith, Eddie, 4,223,960, Cl. 308-78.000.
Reeves Brothers, Inc.: *See*—
Priest, David C., 4,224,374, Cl. 428-310.000.
Regie Nationale des Usines Renault: *See*—
Castarede, Armand, 4,223,647, Cl. 123-59.00A.
Quemerais, Philippe; and Veron, Jean, 4,223,571, Cl. 74-759.000.
Valentin, M. Daniel, 4,223,533, Cl. 60-547.00R.
Reick, Franklin G., to Ebert, Michael, a part interest. Lubricant oil containing polytetrafluoroethylene and fluorochemical surfactant. 4,224,173, Cl. 252-52.00A.
Reifenhauser KG: *See*—
Klein, Josef, 4,224,272, Cl. 264-209.000.
Reil, Wilhelm, to Tetra Pack Developpement S.A. Opening means for a packaging means of flexible material. 4,223,789, Cl. 206-605.000.
Reinecke, Erich, to WABCO Westinghouse GmbH. Load-dependent braking force control device. 4,223,955, Cl. 303-22.00R.
Reinehr, Ulrich; Herbertz, Toni; and Jungverdorben, Hermann-Josef, to Bayer Aktiengesellschaft. Process for spinning hygroscopic filaments and fibers. 4,224,269, Cl. 264-171.000.
Reinhardt, Friedrich, to Hoechst Aktiengesellschaft. Process for preparing fast dyeings and prints on cellulose fiber materials and their mixtures with synthetic fibers. 4,224,026, Cl. 8-532.000.
Reinhardt, Helmut: *See*—
Brandt, Bernd; Nauroth, Peter; Peters, Albert; and Reinhardt, Helmut, 4,224,295, Cl. 423-335.000.
Reinhardt, Robert M.; and Kullman, Russell M. H., to United States of America, Agriculture. Durable press finishing treatment for cellulose textiles employing an aluminum acetate catalyst solution. 4,224,030, Cl. 8-115.700.
Reinicke, Robert H., to Parker-Hannifin Corporation. Solenoid operated bipropellant valve. 4,223,698, Cl. 137-595.000.
Reis, James J.: *See*—
Lynch, Robert T.; and Reis, James J., 4,224,678, Cl. 364-724.000.
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., to California Institute of Technology. Protein specific polymeric immunomicrospheres. 4,224,198, Cl. 260-8.000.
Rembaum, Alan; Gupta, Amitava; and Volksen, Willi, to California Institute of Technology. Polyvinyl pyridine microspheres. 4,224,359, Cl. 427-221.000.
Renault, Christian L. A.: *See*—
Gueremy, Claude G. A.; Hodac, Francoise; and Renault, Christian L. A., 4,224,332, Cl. 424-267.000.
Reneau, Bobby J.; and Manchester, Luther L. Hot tap machine. 4,223,925, Cl. 285-197.000.
Research Institute for Iron, Steel and Other Metals of the Tohoku University, The: *See*—
Hirai, Toshio; and Niihara, Koichi, 4,224,296, Cl. 423-344.000.
Resnick, Bruce M.: *See*—
Schneider, Louis; and Resnick, Bruce M., 4,224,245, Cl. 260-565.000.
Resnick, Martin L.: *See*—
Fahey, Robert J.; and Resnick, Martin L., 4,224,478, Cl. 179-18.0FA.
Retana, Alfonso G., to Promotora de Tecnologia Industrial, S.A. Flame retardant compositions and method of preparing same. 4,224,169, Cl. 252-8.100.
Reticon Corporation: *See*—
Tanaka, Satoru C., 4,224,585, Cl. 333-165.000.
Reyes, Daniel. Vehicular wheel load reducing device. 4,223,912, Cl. 280-767.000.
Reynolds, Richard N., Jr.; Ziman, Stephen D.; and Chan, David C. K., to Chevron Research Company. Acylation of a lactone-substituted aniline compound in the absence of an acid acceptor. 4,224,453, Cl. 549-63.000.
Rheinmetall GmbH: *See*—
Backstein, Guenter; and Unger, Walter, 4,223,608, Cl. 102-244.000.
Post, Lothar, 4,223,589, Cl. 89-33.0SF.
Rhone-Poulenc Industries: *See*—
Amicel, Charles; Biot, Bernard; Butruille, Yves; and Ollivier, Christian, 4,224,094, Cl. 156-169.000.
Locatelli, Jean-Louis; and Macabrey, Louis, 4,224,216, Cl. 260-42.180.
Rich, Joseph A., to Electric Power Research Institute, Inc. Vacuum discharge device with rod electrode array. 4,224,550, Cl. 313-146.000.
Rich, Lewis C.; DiFranco, Julius V.; and Timms, Robert J., to Sperry Corporation. Radar system with a multiplicity of antenna beams for elevation coverage. 4,224,618, Cl. 343-5.0EM.
Richardson Graphics Company: *See*—
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,224,398, Cl. 430-175.000.
Richardson-Merrell, Inc.: *See*—
Shah, Nutan B., 4,224,310, Cl. 424-54.000.
Richardson, Warner G.: *See*—
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,223,460, Cl. 37-8.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.
Richtzenhain, Hermann: *See*—
Flick, Wilhelm; Richtzenhain, Hermann; Hunger, Volker; and Joch, Wilhelm, 4,224,234, Cl. 260-448.80A.
Ricoh Company, Limited: *See*—
Kanda, Hajime, 4,224,641, Cl. 358-257.000.
Rieber, Klaus: *See*—
Lubecki, Andrzej; and Rieber, Klaus, 4,224,517, Cl. 250-272.000.
Riede, Gerhard, to Cambro AG. Device for diffusing matter between two fluids via semi-permeable diaphragms. 4,224,159, Cl. 210-232.000.
Riederer, Hans; Fuchs, Adolf; and Vial, Raymond, to Concast AG. Roller apron for a continuous casting installation. 4,223,719, Cl. 164-448.000.
Riediker, Werner, to Sulzer Brothers Limited. Electrolytic method and apparatus for producing magnesium from a salt solution containing magnesium sulphate. 4,224,120, Cl. 204-70.000.
Riedle, Rudolf: *See*—
Straussberger, Herbert; Streckel, Willi; and Riedle, Rudolf, 4,224,297, Cl. 423-348.000.
Rieter Deutschland GmbH: *See*—
Weber, Kurt, 4,223,422, Cl. 19-159.00R.
Riggs, Donnie E. Athletic shoe for racing and training. 4,223,459, Cl. 36-114.000.
Righi, Nerio, to Rivelica S.n.C. di Limoni Clindo; Del Cario, Adriano; and Righi, Nerio. Retainer device for chuck jaws. 4,223,898, Cl. 279-1.00R.
Ringel, Helmut: *See*—
Langen, Hans; Naefe, Paul; and Ringel, Helmut, 4,224,258, Cl. 264-0.500.
Riordan, Edward D.; and Mangan, John P., to Joyal Products, Inc. Method and apparatus for controlling a brazing machine. 4,224,496, Cl. 219-110.000.
Ritter, Ernst: *See*—
Jaenke, Hans-Jurgen A. W., deceased; Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, 4,223,653, Cl. 123-366.000.
Riva Calzoni S.p.A.: *See*—
Ortelli, Aurelio, 4,223,595, Cl. 92-72.000.
Rivelica S.n.C. di Limoni Clindo: *See*—
Righi, Nerio, 4,223,898, Cl. 279-1.00R.
Rivier, Georges; and Forat, Gerard, to Orogil. Novel lubricant additives containing phosphorus and nitrogen and lubricant compositions containing them. 4,224,171, Cl. 252-46.700.
Rmax, Inc.: *See*—
Krebel, Edgar A.; Vaden, Walter Z.; and Blanpied, Robert H., 4,223,505, Cl. 52-509.000.
Roadarmel, Gary W.: *See*—
Arndt, John J.; Roadarmel, Gary W.; and Wirick, Francis D., 4,224,001, Cl. 403-163.000.
Robert Bosch GmbH: *See*—
Buchner, Norbert, 4,223,512, Cl. 53-425.000.
Glockler, Otto; Herth, Harro; Wilfert, Thomas; and Kraus, Bernd, 4,223,643, Cl. 123-492.000.
Jaenke, Hans-Jurgen A. W., deceased; Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, 4,223,653, Cl. 123-366.000.

Latsch, Reinhard; Schmidt, Peter J.; and Wahl, Josef, 4,223,644, Cl. 123-489.000.
Schaller, Gotthilf; Ursel, Eckhard; Fritsch, Werner; Seibicke, Horst; and Dostler, Wolfgang, 4,223,841, Cl. 239-284.00A.
Wessel, Wolf; Sautter, Wilfried; Engel, Gerhard; and Stumpp, Gerhard, 4,223,654, Cl. 123-358.000.
Roberts, Derek A.: *See—*
Dodd, Alec G.; Gale, Anthony G.; and Roberts, Derek A., 4,224,011, Cl. 416-97.00R.
Roberts, James E., Jr.; and Voelker, James E., to Robintech, Inc. Gasket for multiple groove pipe and method of using same. 4,223,895, Cl. 277-169.000.
Roberts, James K.: *See—*
Grabb, Frederick G.; and Roberts, James K., 4,223,903, Cl. 280-96.100.
Roberts, Joseph A., to Advanced Circuit Technology. Circuit board with self-locking terminals. 4,223,435, Cl. 29-830.000.
Roberts, Rex D.; and Hardy, William B., to American Cyanamid Company. Process for the preparation of 2-aryl-2H-benzotriazoles. 4,224,451, Cl. 548-260.000.
Robertshaw Controls Company: *See—*
Bible, Harley V.; and Moon, William T., Jr., 4,223,701, Cl. 137-882.000.
Robins Industries Corp.: *See—*
Alexandrovich, George, Sr., 4,224,649, Cl. 360-128.000.
Robinson, Charles E.; and Nieberger, Melvin. Motor brake control system. 4,223,649, Cl. 123-319.000.
Robinson, Elbert W. Cooling tower construction and fill. 4,224,257, Cl. 261-23.00R.
Robinson, Frank D., to Robinson Helicopter Company. Process for bonding main rotor blades from parts having different coefficients of thermal expansion. 4,223,429, Cl. 29-156.80B.
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Robinson, Frank D., 4,223,429, Cl. 29-156.80B.
Robinson, Ivan M.: *See—*
Pechhold, Engelbert; and Robinson, Ivan M., 4,224,432, Cl. 528-76.000.
Robinson, Lee F. Reforming of hydrocarbons. 4,224,298, Cl. 423-359.000.
Robinson, Ralph C., to Olympian Stone Company, Inc. Building panel with stone facing and glass fiber reinforced concrete. 4,223,502, Cl. 52-315.000.
Robintech, Inc.: *See—*
Roberts, James E., Jr.; and Voelker, James E., 4,223,895, Cl. 277-169.000.
Roch, Josef; Muller, Erich; Narr, Berthold; Nickl, Josef; and Haarmann, Walter, to Boehringer Ingelheim GmbH. 3-Amino-4-phenyl-6-thiomorpholino-1H-pyrazolo-[3,4-b]pyridines and salts thereof. 4,224,322, Cl. 424-246.000.
Roche, David E.: *See—*
Lowry, Alan B.; Roche, David E.; and Mathus, Gregory, 4,223,787, Cl. 206-387.000.
Rochford, Robert S.; Leckonby, Robert S.; Lutwen, Ronald C.; and Cymny, Gerald A., to Babcock & Wilcox Company, The. Fuel firing. 4,223,640, Cl. 122-1.00R.
Rockwell International Corporation: *See—*
Adkins, Larry R., 4,224,683, Cl. 364-821.000.
Alexander, Robert H., 4,223,555, Cl. 73-139.000.
Brinkman, John A., 4,223,557, Cl. 73-861.550.
Spence, John R., 4,224,532, Cl. 307-237.000.
Rockwell, Kenneth N., to Thomas & Betts Corporation. High speed parallel scanning means for testing or monitoring the assembly of multiwire harnesses. 4,224,690, Cl. 371-25.000.
Rocky Mountain Foam Form, Inc.: *See—*
DeLozier, Howard K., 4,223,501, Cl. 52-309.110.
Roderick, Guy A.: *See—*
Lampkin, Curtis M.; Roderick, Guy A.; and Locke, Peter, 4,224,355, Cl. 427-8.000.
Rodgers, Thomas P.: *See—*
Gorchev, Dimiter; Rodgers, Thomas P.; and Willke, Herbert L., Jr., 4,223,832, Cl. 236-49.000.
Rogatkin, Alexandr A.: *See—*
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.
Rohm GmbH: *See—*
Buergle, Peter; Maurer, Karl; Munzer, Manfred; Rosskopp, Wilhelm; and Wenzel, Franz, 4,224,425, Cl. 526-85.000.
Moench, Theodor P.; and Hanstein, Friedrich, 4,223,493, Cl. 52-200.000.
Rohm and Haas Company: *See—*
Meitzner, Erich F.; and Oline, James A., 4,224,415, Cl. 521-38.000.
Roling, William J., to Control Data Corporation. Disc centering. 4,224,648, Cl. 360-97.000.
Rolls-Royce Limited: *See—*
Dodd, Alec G.; Gale, Anthony G.; and Roberts, Derek A., 4,224,011, Cl. 416-97.00R.
Romankiw, Lubomyr T., to International Business Machines Corporation. High temperature lift-off technique. 4,224,361, Cl. 427-259.000.
Romanski, Eric R., to Albany International Corp. Paper machine clothing having controlled internal void volume. 4,224,372, Cl. 428-257.000.
Rommel, Reiner. Manually operated cutting pliers for cables, wires, profiles or the like. 4,223,439, Cl. 30-250.000.
Rorer Group, Inc.: *See—*
DiVincenzo, Gary A., 4,223,856, Cl. 244-50.000.
Rosman, Irwin E. Method of joining workpieces with a rivet fastener system. 4,223,433, Cl. 29-509.000.
Ross, Sigmund L.; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, to Shuffman, Rose, executrix, executrix of Oscar Shuffman. Cryothermal manipulation of petroleum. 4,223,536, Cl. 62-45.000.
Rossi, Guglielmo, to Ranco Incorporated. Electrical switch devices. 4,224,488, Cl. 200-67.00A.
Rosskopf, Philip A.: *See—*
Moitra, Santanu; and Rosskopf, Philip A., 4,224,076, Cl. 106-90.000.
Rosskopp, Wilhelm: *See—*
Buergle, Peter; Maurer, Karl; Munzer, Manfred; Rosskopp, Wilhelm; and Wenzel, Franz, 4,224,425, Cl. 526-85.000.
Rostock, Kai; Birke, Johann; Wiedholz, Rudolf; Bauer, Johann; and Balwe, Thomas, to Wacker-Chemie GmbH. Process for prevention of foaming when steam-stripping residual monomer from aqueous polymer dispersions. 4,224,437, Cl. 528-500.000.
Roth, Clarence E.: *See—*
Thompson, Kenneth P.; Ihde, Richard C.; and Roth, Clarence E., 4,224,092, Cl. 156-82.000.
Roth, Ernst, to Siegenia-Frank KG. Window hardware. 4,223,928, Cl. 292-157.000.
Rothchild, Ronald D., to Airco, Inc. Methods and apparatus for controlling gas flows. 4,223,450, Cl. 34-16.000.
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, to United States of America, Army. Permanent magnet materials. 4,224,067, Cl. 75-170.000.
Rougeau, Edward L.: *See—*
Acero, Steve A.; and Rougeau, Edward L., 4,224,131, Cl. 204-274.000.
Roussel Uclaf: *See—*
Amiard, Gaston; Bormann, Dieter; Duerckheimer, Walter; and Jolly, Jean, 4,224,371, Cl. 424-246.000.
Clemence, Francois; Humbert, Daniel; and Fournex, Robert, 4,224,333, Cl. 424-267.000.
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,224,227, Cl. 260-347.400.
Rowe, Lacy A.: *See—*
Whitley, John A.; and Rowe, Lacy A., 4,223,828, Cl. 232-45.000.
Royer, Antonio. Telescopic structural element for making modular closets, partition walls, door supports and the like. 4,223,967, Cl. 312-245.000.
Rozas, Gunther. Exit air duct for the discharge of gases produced in coke-ovens. 4,224,111, Cl. 202-255.000.
Rubin, Albert L.: *See—*
Miyata, Teruo; Rubin, Albert L.; Dunn, Michael W.; and Stenzel, Kurt H., 4,223,984, Cl. 351-160.00H.
Rude, Harold E.; and Newell, Richard G., to Minnesota Mining and Manufacturing Company. Modified epoxy resin-polyisocyanate resin system. 4,224,422, Cl. 525-454.000.
Rudzena, William L.: *See—*
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.
Ruegg, Rudolf: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,224,244, Cl. 260-562.00R.
Rumianca S.p.A.: *See—*
Baldi, Luciano; Messori, Vittorio; and Francese, Renato, 4,224,444, Cl. 544-204.000.
Russell, Burdsall & Ward Corporation: *See—*
Tabor, Joseph A., 4,223,711, Cl. 151-37.000.
Russell, James T., to Jacobs, Eli S. Compression and expansion circuitry for a recording and playback system. 4,224,481, Cl. 179-100.30B.
Ruzic, Hugo, to International Standard Electric Corporation. Labyrinth path multiple cable holder with strain relief. 4,224,465, Cl. 174-135.000.
Ruzicka, Jaromir: *See—*
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Ryan, Jay R.: *See—*
Alvensleben, Eric; Ryan, Jay R.; and Gaughran, Wayne C., 4,223,633, Cl. 118-203.000.
Ryser, Gottlieb: *See—*
Bollag, Werner; Ruegg, Rudolf; and Ryser, Gottlieb, 4,224,244, Cl. 260-562.00R.
S. C. Johnson & Son, Inc.: *See—*
van Lit, Klass J., 4,223,812, Cl. 222-180.000.
S. G. Brown Limited: *See—*
Brook, David L. (said David L. Brook assors. to), 4,224,573, Cl. 328-1.000.
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Safter, J. Laurence: *See—*
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Sagami Chemical Research Center: *See—*
Saito, Tomo; Nishiyama, Yumiko; Watanabe, Kazuo; and Morikawa, Naotake, 4,223,448, Cl. 34-4.000.
Sager, Thomas B., to Branson Ultrasonics Corp. Method of producing corners in channel material using ultrasonic energy. 4,224,091, Cl. 156-73.300.
St. Clair, Alfred L. Roof construction and method of making the same. 4,223,487, Cl. 52-11.000.

St. Clair, Alfred L. Building anchor. 4,223,492, Cl. 52-157.000.
Saint-Gobain Industries: *See—*
Paymal, Andre, 4,223,667, Cl. 126-450.000.
St. Louis, Paul T., to Construction Technology, Inc. Backhoe mounted vibrating plate soil compactor. 4,224,003, Cl. 404-133.000.
Saito, Junji: *See—*
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, 4,224,292, Cl. 423-239.000.
Saito, Tomo; Nishiyama, Yumiko; Watanabe, Kazuo; and Morikawa, Naotake, to Sagami Chemical Research Center. Dehydration and incineration of sample material. 4,223,448, Cl. 34-4.000.
Saitoh, Mituo; and Kamiyama, Yasuo, to Citizen Watch Co., Ltd. Wristwatch movement. 4,223,521, Cl. 368-204.000.
Sakaki, Michinori: *See—*
Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, 4,224,098, Cl. 156-512.000.
Sakamoto, Kaneaki, to Kabushiki Kaisha Chuck Seisakusho. Small size, portable bender. 4,223,543, Cl. 72-30.000.
Sakamoto, Mitsuhiro: *See—*
Yukimoto, Kazuyoshi; Ogasawara, Shinzi; Sakamoto, Mitsuhiro; and Kawamura, Yasunori, 4,223,420, Cl. 16-128.100.
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Salkin, Burton: *See—*
Goldhaber, Richard P.; Miller, Jimmy L.; Salkin, Burton; and Schnell, William J., 4,224,163, Cl. 210-321.00B.
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Salter, Robert S.: *See—*
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., 4,224,122, Cl. 204-119.000.
Sanborn, Duane F.; and Ware, Chester D., to Trane Company, The. Air cooled centrifugal water chiller with refrigerant stripper means. 4,223,537, Cl. 62-174.000.
Sandeen, Michael W. Combination smoking device and a lighter for smoking material. 4,223,687, Cl. 131-180.000.
Sander, Bruno; Bonitz, Eckhard; and Scherling, Kurt, to BASF Aktiengesellschaft. Manufacture of fibrids from polymers. 4,224,259, Cl. 264-11.000.
Sanders Associates, Inc.: *See—*
Mercer, William R.; Wurst, William C.; and Brodeur, Lester R., 4,224,623, Cl. 343-103.000.
Sanderson, Karl, to Lee Wilson Engineering Company of Canada. Annealing furnace. 4,223,877, Cl. 266-262.000.
Sandoz, Inc.: *See—*
Barcza, Sandor, 4,224,317, Cl. 424-184.000.
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Sano, Kozo: *See—*
Aoyama, Tetsuo; Horie, Shigeru; Sano, Kozo; Kiga, Hidetaka; Mizuno, Kinichi; and Ikarashi, Takeo, 4,224,243, Cl. 260-561.00R.
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Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, 4,224,103, Cl. 162-135.000.
Santen Pharmaceutical Co., Ltd.: *See—*
Iwao, Jun-ichi; Oya, Masayuki; Kato, Eishin; and Watanabe, Toshio, 4,224,457, Cl. 562-401.000.
Santora, Norman F.: *See—*
Campbell, Henry F.; Santora, Norman F.; and Douglas, George H., 4,224,340, Cl. 424-304.000.
Sappington, Marr D.; and Katinsky, John. Apparatus for feeding poultry. 4,223,638, Cl. 119-52.00B.
Sasaki, Hajime: *See—*
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Power level setting/display circuit for a microwave oven. 4,224,685, Cl. 364-900.000.
Sasaki, Shiro: *See—*
Mori, Mamoru; Sasaki, Shiro; and Kinaga, Eiichi, 4,223,917, Cl. 280-806.000.
Sasaki, Tadao; Natori, Takasi; and Komaru, Isamu, to Nippon Crucible Co., Ltd. Active silicon carbide powder containing a boron component and process for producing the same. 4,224,073, Cl. 106-44.000.
Sasaki, Yasuo, to Displaytek Corporation of Sanko; and Daiwa Shinku Corporation. Controlling unit for A.C. driving an electrostatic device. 4,224,557, Cl. 318-116.000.
Sato, Hiromi: *See—*
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,224,344, Cl. 424-330.000.
Sato, Hiroo; Ikeda, Yoshihiko; and Katsumata, Mitsuo, to Kokusan Kenki Co., Ltd. Safety device for controlling an ignition circuit. 4,223,657, Cl. 123-179.00K.
Sato, Masatoshi; and Kajiyoshi, Hidenori, to Kioritz Corporation. Shoulder-supported pneumatic sweeping apparatus. 4,223,419, Cl. 15-327.00C.
Sato, Shoji: *See—*
Ishige, Yoshiki; Kinugasa, Toshiyuki; Ando, Yoshio; and Sato, Shoji, 4,224,376, Cl. 428-315.000.
Satoh, Isao; and Kato, Makoto, to Matsushita Electric Industrial Co., Ltd. Holographic playback system using a charge storage sensor and binary decoding. 4,224,480, Cl. 179-100.30G.
Satomi, Yoshihito: *See—*
Fujimori, Kuniaki; Satomi, Yoshihito; Suzuka, Teruo; and Aizawa, Shirou, 4,224,140, Cl. 208-124.000.
Sauer, Donald G., to National Can Corporation. Process for making containers. 4,224,275, Cl. 264-516.000.
Sauer, Robert J. Boot support. 4,223,416, Cl. 12-114.600.
Sauer, Wolfgang; Fliege, Werner; Dudeck, Christian; and Petri, Norbert, to BASF Aktiengesellschaft. Preparation of aromatic and araliphatic aldehydes. 4,224,254, Cl. 568-431.000.
Saur, Charles W., to Rapistan Incorporated. Accumulation conveyors. 4,223,780, Cl. 198-781.000.
Sautel, Francis: *See—*
Bayssat, Michel; Sautel, Francis; Depin, Jean-Claude; and Betbeder Matibet, Annie, 4,224,341, Cl. 424-308.000.
Sautter, Wilfried: *See—*
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Savit, Carl H., to Western Geophysical Co. of America. Method and apparatus for demultiplexing multiplexed seismic data. 4,224,474, Cl. 370-68.000.
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, to Mitsubishi Chemical Industries, Limited. Method and apparatus for the measurement of antigens and antibodies. 4,224,304, Cl. 424-12.000.
Sawyer, Kass W.: *See—*
Croisant, Elmer E.; and Sawyer, Kass W., 4,223,773, Cl. 192-48.910.
Sbragia, Ronald J.; Hardy, John L.; Engelhart, John E.; Gitlitz, Melvin H.; and Ehr, Robert J., to Dow Chemical Company, The; and M&T Chemicals Inc. Simultaneous fungicidal and miticidal protection of plants employing certain tin compounds. 4,224,338, Cl. 424-288.000.
Scallet, Barrett L.: *See—*
Van Blanton, M.; and Scallet, Barrett L., 4,224,219, Cl. 260-112.00G.
Schaefer, Emil: *See—*
Streit, Werner; Fikentscher, Rolf; Gans, Karl; Welzel, Gerhard; Glaser, Klaus; and Schaefer, Emil, 4,224,421, Cl. 525-403.000.
Schaller, Gotthilf; Ursel, Eckhard; Fritsch, Werner; Seibicke, Horst; and Dostler, Wolfgang, to Robert Bosch GmbH. Arrangement for washing lenses of headlights. 4,223,841, Cl. 239-284.00A.
Schally, Andrew V.: *See—*
Meyers, Chester A.; Coy, David H.; and Schally, Andrew V., 4,224,199, Cl. 260-8.000.
Schaltbau Gesellschaft mbH: *See—*
Dietrich, Bernhard, 4,224,489, Cl. 200-76.000.
Scharnhorst, Kurt P.: *See—*
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Schatteman, Etienne A. M., to Staar, S.A. Automatic preferred tape track selection for bi-directional tape transport. 4,224,646, Cl. 360-74.200.
Scheidler, Ralph E., to Sure Power Products, Inc. Voltage regulator with electrically isolated output stage. 4,224,562, Cl. 322-26.000.
Schelev, Mikhail Y.: *See—*
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.
Scherberich, Paul: *See—*
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Schering, Aktiengesellschaft: *See—*
Dahl, Helmut; Schottle, Ernst; Wieske, Reinhold; Weber, Alfred; and Kennecke, Mario, 4,224,320, Cl. 424-243.000.
Scherling, Kurt: *See—*
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Scheurecker, Werner, to Voest-Alpine Aktiengesellschaft. Method of repairing a plate mould to be used for continuous casting of steel. 4,223,717, Cl. 164-76.000.
Scheutle, Erich: *See—*
Konig, Gunter; Mutschler, Gunter; Scheutle, Erich; and Bucher, Erich, 4,223,519, Cl. 57-291.000.
Schiessler, Siegfried: *See—*
Spietschka, Ernst; Schiessler, Siegfried; and Tronich, Wolfgang, 4,224,222, Cl. 260-314.500.
Schiff, Sidney, to Phillips Petroleum Company. Treatment of sulfur-containing lubricating oil to increase resistance to oxidation. 4,224,139, Cl. 208-18.000.
Schiller, Arthur M.: *See—*
Balcerski, James S.; Schiller, Arthur M.; and Snow, Arthur, 4,224,149, Cl. 210-705.000.
Schippers, Heinz; and Lenk, Erich, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Chucking spindle for the reception of a bobbin carrier. 4,223,849, Cl. 242-46.400.
Schlage Lock Company: *See—*
Neary, Ralph E., 4,223,931, Cl. 292-347.000.
Schlie, Gerhard: *See—*
Selonke, Fritz; Komossa, Werner; Elsner, Uwe; and Schlie, Gerhard, 4,223,845, Cl. 241-34.000.
Schlumberger Technology Corporation: *See—*
Johnstone, Charles W., 4,224,516, Cl. 250-262.000.
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Schmelzer, Hans G.: *See—*
Dieterich, Dieter; Balle, Gerhard; and Schmelzer, Hans G., 4,224,418, Cl. 521-170.000.

Schmider, Paul; Mandl, Herwig; and Ihlefeldt, Dietmar, to Beckman Instruments, GmbH. Pipetting and diluting apparatus. 4,223,558, Cl. 73-421.00R.
Schmidt, George F., to Kimberly Clark Corporation. Alkaline battery, separator therefore. 4,224,394, Cl. 429-252.000.
Schmidt, Hans-Joachim: *See—*
Wunder, Friedrich; Arpe, Hans-Jurgen; Leupold, Ernst I.; and Schmidt, Hans-Joachim, 4,224,236, Cl. 260-449.00R.
Schmidt-Hatting, Wolfgang, to Swiss Aluminium Ltd. Electrolytic reduction cell with compensating components in its magnetic field. 4,224,127, Cl. 204-243.00M.
Schmidt, Jerry D. Apparatus for eliminating amplitude modulation interference in conically scanning radars. 4,224,622, Cl. 343-7.400.
Schmidt, Klaus: *See—*
Jaenke, Hans-Jurgen A. W., deceased; Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, 4,223,653, Cl. 123-366.000.
Schmidt, Peter J.: *See—*
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Schmitt, Frederick L.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,224,352, Cl. 426-538.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,176, Cl. 252-174.110.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,346, Cl. 426-3.000.
Schmitt, Kirk D.; and Bridger, Robert F., to Mobil Oil Corporation. Oil-soluble adducts of benzotriazole and oxazolines and lubricant compositions containing same. 4,224,172, Cl. 252-51.50R.
Schmitt, Susan M.: *See—*
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Schmoock, James C.: *See—*
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Schneider, Georg: *See—*
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Schneider, Louis; and Resnick, Bruce M., to GAF Corporation. Method of making 1-(alkoxyphenyl)-5-(phenyl)biguanide compounds which are useful as agricultural fungicides. 4,224,245, Cl. 260-565.000.
Schneider, Manfred: *See—*
Janz, Joachim; and Schneider, Manfred, 4,223,940, Cl. 296-37.120.
Schneider, Michel, to Battelle Memorial Institute. Process for the preparation of liposomes in aqueous solution. 4,224,179, Cl. 252-316.000.
Schnell, William J.: *See—*
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Schnoes, Heinrich K.: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,224,230, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,224,231, Cl. 260-397.200.
Schoen, Alan H. Set of tiles for covering a surface. 4,223,890, Cl. 273-157.00R.
Schoenberger, Eva: *See—*
Haber, Raphael R. G.; and Schoenberger, Eva, 4,224,448, Cl. 546-167.000.
Schoendorfer, Donald W.; and Raymond, Stephen A., to Massachusetts Institute of Technology. Internal laryngeal prosthesis. 4,223,411, Cl. 3-1.300.
Schoenfelder, James L., to Solar, Inc. Heat storage containers filled with the combination of a eutectic salt and a non-biodegradable filler material. 4,223,721, Cl. 165-104.00S.
Schoenung, Alois F., to Rapid Mounting & Finishing Company. Ceiling hanger. 4,223,488, Cl. 52-39.000.
Scholle Corporation: *See—*
Scholle, William R., 4,224,367, Cl. 428-76.000.
Scholle, William R., to Scholle Corporation. Multiple ply packaging material comprising outer plies sealed around an inner ply. 4,224,367, Cl. 428-76.000.
Scholten, Joseph J. F.; and Van de Leemput, Lambertus J. M. A., to Stamicarbon, B.V. Process of preparing a porous, pure silica. 4,224,189, Cl. 252-458.000.
Schonhardt, Peter: *See—*
Haas, Wolfgang; and Schonhardt, Peter, 4,224,484, Cl. 200-38.0FB.
Schoning, Josef: *See—*
Mitterbacher, Paul; Schoning, Josef; and Schwiers, Hans G., 4,223,496, Cl. 52-224.000.
Schonken, Tobias D.: *See—*
Allen, James C. H.; Schonken, Tobias D.; and Botma, Johan C., 4,224,651, Cl. 361-28.000.
Schopf, Jorg, to Schopf Maschinebau GmbH. Loader, especially bucket loader for underground mining. 4,223,758, Cl. 180-291.000.
Schopf Maschinebau GmbH: *See—*
Schopf, Jorg, 4,223,758, Cl. 180-291.000.
Schottle, Ernst: *See—*
Dahl, Helmut; Schottle, Ernst; Wieske, Reinhold; Weber, Alfred; and Kennecke, Mario, 4,224,320, Cl. 424-243.000.
Schrade, Jean, to Swiss Aluminium Ltd. Can for preserving foodstuffs and process for its manufacture. 4,223,798, Cl. 220-66.000.
Schroeder, Wilburn C. Recovery of catalysts from the hydrogenation of coal. 4,224,137, Cl. 208-10.000.
Schroeter, Siegfried H.; and Olson, Daniel R., to General Electric Company. Abrasion resistant organopolysiloxane coated polycarbonate article. 4,224,378, Cl. 428-412.000.
Schrunk, Thomas R. Decorative stained glass insert unit for windows. 4,223,499, Cl. 52-308.000.
Schubert & Salzer: *See—*
Husges, Gerd; Schuller, Edmund; Karl, Rupert; and Grimm, Eberhard, 4,223,517, Cl. 57-261.000.
Karl, Rupert; and Schuller, Edmund, 4,223,518, Cl. 57-263.000.
Schue, Francois: *See—*
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.
Schuessler, William A.: *See—*
Steinert, Robert B.; and Schuessler, William A., 4,224,282, Cl. 422-111.000.
Schuller, Edmund: *See—*
Husges, Gerd; Schuller, Edmund; Karl, Rupert; and Grimm, Eberhard, 4,223,517, Cl. 57-261.000.
Karl, Rupert; and Schuller, Edmund, 4,223,518, Cl. 57-263.000.
Schulman, Joseph H.; Mann, Brian M.; and Beane, Russell R., to Pacesetter Systems, Inc. Telemetry means for tissue stimulator system. 4,223,679, Cl. 128-419.0PT.
Schulz, Johann G. D.: *See—*
Onopchenko, Anatoli; and Schulz, Johann G. D., 4,224,232, Cl. 260-413.000.
Schulz, Walther; and Gebetsberger, Wilhelm, to Wintershall Aktiengesellschaft. Method for the tertiary recovery of petroleum by flooding with hot water and an aqueous alkaline solution. 4,223,730, Cl. 166-272.000.
Schumacher, Bernd: *See—*
Fricker, Paul; Vogler, Gottfried; Knecht, Hans-Rudolf; Pierobon, Giampaolo; Schumacher, Bernd; and Zimmerman, Arnold, 4,224,495, Cl. 219-69.00V.
Schwartz, Reinhard: *See—*
Jaenke, Hans-Jurgen A. W., deceased; Ritter, Ernst; Schwartz, Reinhard; and Schmidt, Klaus, 4,223,653, Cl. 123-366.000.
Schwarz, Anton. Tube joint between two intersecting tubes. 4,223,924, Cl. 285-189.000.
Schwarze, Werner: *See—*
Kleemann, Axel; Klenk, Herbert; Offermanns, Heribert; Scherberich, Paul; and Schwarze, Werner, 4,224,226, Cl. 260-347.300.
Schweer, Wilhelm: *See—*
Goeke, Alfons; Hartkopf, Heinz; Tuckmantel, Eberhand; and Schweer, Wilhelm, 4,223,578, Cl. 82-1.00C.
Schwiers, Hans G.: *See—*
Mitterbacher, Paul; Schoning, Josef; and Schwiers, Hans G., 4,223,496, Cl. 52-224.000.
SCM Corporation: *See—*
Kane, Bernard J.; and Traynor, Sean G., 4,224,240, Cl. 260-503.000.
Scott, Lex A.: *See—*
Mosley, William H.; Scott, Lex A.; and Gordy, Robert S., 4,224,575, Cl. 329-50.000.
Scott Paper Company: *See—*
Anderson, James E., 4,223,677, Cl. 128-287.000.
Sealed Power Corporation: *See—*
Anderson, David L.; and Joseph, A. David, 4,224,161, Cl. 210-232.000.
Seay, Wilfred M.: *See—*
Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., 4,224,621, Cl. 343-5.0EM.
Sebag, Henri: *See—*
Vanlerberghe, Guy; and Sebag, Henri, 4,224,311, Cl. 424-59.000.
Secoh Giken, Inc.: *See—*
Ban, Itsuki; and Kanno, Hidenori, 4,224,650, Cl. 360-137.000.
Seibicke, Horst: *See—*
Schaller, Gotthilf; Ursel, Eckhard; Fritsch, Werner; Seibicke, Horst; and Dostler, Wolfgang, 4,223,841, Cl. 239-284.00A.
Seiersen, Ole S., to Christian Rovsing A/S. Apparatus for detecting echo signals. 4,224,620, Cl. 343-5.0VQ.
Seiler, Claus-Dietrich; and Vahlensieck, Hans-Joachim, to Dynamit Nobel Aktiengesellschaft. Process for the production of alkylsilanes. 4,224,233, Cl. 556-478.000.
Sekiguchi, Tetsuo: *See—*
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, 4,224,203, Cl. 260-23.0XA.
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, 4,224,218, Cl. 260-45.7PH.
Sekine, Hisashi: *See—*
Tachikawa, Kyoji; and Sekine, Hisashi, 4,224,087, Cl. 148-133.000.
Sekiya, Fukuo: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,224,531, Cl. 307-221.00C.
Sellner, Harvey R., to Perkin-Elmer Corporation, The. Arrays for parallel pattern recognition. 4,224,600, Cl. 340-146.3MA.
Selonke, Fritz; Komossa, Werner; Elsner, Uwe; and Schlie, Gerhard, to Hauni-Werke Korber & Co., KG. Tobacco shredding apparatus. 4,223,845, Cl. 241-34.000.
Semi, Hidetoshi: *See—*
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,224,685, Cl. 364-900.000.
Sendai, Michiyuki: *See—*
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,224,441, Cl. 544-16.000.

Senor, Ronald E., to Texas Instruments Incorporated. Motor protector with metal housing and with preformed external heater thereon. 4,224,591, Cl. 337-102.000.

Sensor Technology, Inc.: *See*—
Weber, Otto K., 4,224,514, Cl. 250-231.0SE.

Sepp, Walter E.: *See*—
Pritchard, Dalton H.; Sepp, Walter E.; and Lagoni, William A., 4,224,638, Cl. 358-31.000.

Seppelt, Bernhard, to Th. Kieserling & Albrecht. Apparatus and method for machining cylindrical internal surfaces. 4,223,577, Cl. 82-1.00C.

Sequeira, Avilino, Jr.; and Barger, Frank L., to Texaco Inc. Control system for an MP refining unit receiving heavy sour charge oil. 4,224,673, Cl. 364-501.000.

Sequeira, Avilino, Jr.; and Barger, Frank L., to Texaco Inc. Control system for an N-methyl-2-pyrrolidone refining unit receiving heavy sweet charge oil. 4,224,674, Cl. 364-501.000.

Serapins, Klaus: *See*—
Piter, Hans; and Serapins, Klaus, 4,223,979, Cl. 350-96.210.

Serdjuchenko, Jury N.: *See*—
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.

Sergev, Sergius S.; Black, Stanley A.; and Jenkins, James F. Portable diver heat generating system. 4,223,661, Cl. 126-204.000.

Servanton, Georges; and Garnier, Michel C., to S.O.M.A.-Europe Transmissions Societe Nouvelle Mecanique et Automobile. Device for braking a vehicle wheel. 4,223,769, Cl. 192-4.00A.

Sezaki, Kazuo: *See*—
Tomizawa, Fumio; Sezaki, Kazuo; Shimizu, Makoto; and Katahashi, Yukinaga, 4,224,056, Cl. 75-11.000.

Shade, Russell L., Jr., to General Electric Company. Controllable inlet header partitioning. 4,223,722, Cl. 165-111.000.

Shafar, Bernard A. Safety reflector for freight cars. 4,223,980, Cl. 350-97.000.

Shah, Nutan B., to Richardson-Merrell, Inc. Dentifrice compositions. 4,224,310, Cl. 424-54.000.

Shane, Tim A.; and O'Hara, Gary J., to Tryom, Inc. Electronic game. 4,223,893, Cl. 273-237.000.

Sharp Kabushiki Kaisha: *See*—
Kawamura, Koichi; Honda, Junichi; Hisatomi, Junichirou; and Shigemasa, Junichiro, 4,224,081, Cl. 136-251.000.

Shaw, Mark L., to Motorola, Inc. Digital frequency quadrupler. 4,224,574, Cl. 328-38.000.

Shaw, Pern: *See*—
Musa, Fuad H.; and Shaw, Pern, 4,224,539, Cl. 307-362.000.

Shaw, Robert F., to Smith, A. C. Signalling particles for introduction into blood flowing through a vessel of interest. 4,224,303, Cl. 424-1.000.

Shea, Michael M.; and Watton, John F., to General Motors Corporation. Transportation stable magnesium and iron diluent particle mixtures for treating molten iron. 4,224,069, Cl. 75-255.000.

Shelby, Robert L.: *See*—
Isaia, Robert L.; Bell, Francis D.; and Shelby, Robert L., 4,223,878, Cl. 267-34.000.

Shelcore, Inc.: *See*—
Greenberg, Sheldon, 4,223,471, Cl. 46-41.000.
Strauss, Manfred, 4,223,474, Cl. 46-87.000.

Shell Oil Company: *See*—
Titus, Paul E., 4,223,691, Cl. 137-13.000.

Sheng, Ming N.: *See*—
Wheaton, Gregory A.; Kao, Jar-lin; and Sheng, Ming N., 4,224,223, Cl. 260-340.200.

Sherlaw, Michael, to Crane Co. Method for making seat assembly for butterfly valves. 4,223,430, Cl. 29-157.10R.

Sherman, Allan P., to Hewlett-Packard Company. Validation of blood pressure. 4,223,681, Cl. 128-672.000.

Sherman, Allan P., to Hewlett-Packard Company. Beat-to-beat systolic and diastolic indicator. 4,223,682, Cl. 128-672.000.

Sherman, James F.: *See*—
Koivunen, Erkki A.; and Sherman, James F., 4,223,569, Cl. 74-665.0GE.

Shestakov, Boris G.: *See*—
Korotkov, Jury A.; Mikhailov, Eduard F.; Andreev, German A.; Eltsov, Boris I.; Polyakov, Jury A.; Shestakov, Boris G.; and Kechina, Galina D., 4,224,291, Cl. 423-178.000.

Shibakawa, Riichiro: *See*—
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, 4,224,314, Cl. 424-122.000.

Shibata, Masaki: *See*—
Tezuka, Shichigoro; and Shibata, Masaki, 4,224,345, Cl. 426-3.000.

Shiber, Samuel. Automotive energy management system. 4,223,532, Cl. 60-414.000.

Shigemasa, Junichiro: *See*—
Kawamura, Koichi; Honda, Junichi; Hisatomi, Junichirou; and Shigemasa, Junichiro, 4,224,081, Cl. 136-251.000.

Shigematsu, Masatsune: *See*—
Kawasaki, Yoshimi; Imaseki, Izumi; Hirano, Satoshi; Amano, Katsuhiko; and Shigematsu, Masatsune, 4,224,195, Cl. 252-546.000.

Shigeta, Masatomo: *See*—
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.

Shimano Industrial Company, Limited: *See*—
Kine, Masayoshi, 4,223,563, Cl. 74-501.00R.
Nagano, Masashi; Fujimoto, Hideaki; Mizuno, Toshio; and Egami, Tetufumi, 4,223,562, Cl. 474-82.000.

Shimizu, Makoto: *See*—
Tomizawa, Fumio; Sezaki, Kazuo; Shimizu, Makoto; and Katahashi, Yukinaga, 4,224,056, Cl. 75-11.000.

Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, to Canon Kabushiki Kaisha. Camera having a sound-making element. 4,223,987, Cl. 354-23.00D.

Shiota, Masashi: *See*—
Fujii, Setsuro; Watanabe, Tsuyoshi; Shiota, Masashi; Itsuo, Okumoto; and Kayama, Naohiro, 4,224,342, Cl. 424-310.000.

Shipley, Randall S.: *See*—
Lowery, Kirby, Jr.; Birkelbach, Donald F.; and Shipley, Randall S., 4,224,186, Cl. 252-429.00C.

Shiraishi, Mitsuru: *See*—
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,224,441, Cl. 544-16.000.

Showa Denko K.K.: *See*—
Nagato, Nobuyuki; and Naito, Taketoshi, 4,224,238, Cl. 260-453.00P.
Takahashi, Shuji, 4,224,133, Cl. 204-290.00R.

Shuffman, Oscar, deceased: *See*—
Ross, Sigmund L.; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, 4,223,536, Cl. 62-45.000.

Shuffman, Rose, executrix: *See*—
Ross, Sigmund L.; Shuffman, Oscar, deceased; and Shuffman, Rose, executrix, 4,223,536, Cl. 62-45.000.

Siddi, Giorgio: *See*—
Colle, Roberto; Gozzo, Franco; Camaggi, Giovanni; and Siddi, Giorgio, 4,224,050, Cl. 71-98.000.

Sidorenko, Valery A.; Morgunsky, Evgeny I.; Plotnikov, Vladimir A.; Vishnev, Nikolai V.; and Yascheritsyn, Petr I. Rotary cutting tool. 4,223,580, Cl. 82-36.00R.

Siebert, Rudolf: *See*—
Ziegenbalg, Siegfried; Fischer, Gerhard; Haake, Gerhard; and Siebert, Rudolf, 4,224,287, Cl. 423-112.000.

Siegenia-Frank KG: *See*—
Roth, Ernst, 4,223,928, Cl. 292-157.000.

Siemens Aktiengesellschaft: *See*—
Heinzl, Joachim, 4,223,998, Cl. 400-126.000.
Mauthe, Manfred, 4,224,635, Cl. 357-41.000.
Thieme, Roland; and Heyneman, Guido, 4,224,281, Cl. 422-100.000.

Siempelkamp Giesserei GmbH & Co. KG: *See*—
Mitterbacher, Paul; Schoning, Josef; and Schwiers, Hans G., 4,223,496, Cl. 52-224.000.

Signetics Corporation: *See*—
Lai, Eric H., 4,224,533, Cl. 307-247.00R.

Siiberg, Hemming G., to Wagner Electric Corporation. Rechargeable flashlight with integral variable rate battery charger for automotive use. 4,224,658, Cl. 362-183.000.

Silva, Frank A., to Amerace Corporation. Splice assembly tool and method of splicing. 4,223,436, Cl. 29-869.000.

Silver, Harry. Attachment for electrical junction box. 4,223,796, Cl. 220-3.800.

Simcoe, Robert J.; and Helfrich, Robert C., to General Electric Company. Time to go and diagnostic display for electronic sequence type appliance controller. 4,224,530, Cl. 307-141.000.

Simmons, James E.: *See*—
Whitted, Robert L.; and Simmons, James E., 4,223,520, Cl. 57-350.000.

Simmons, Joseph H.: *See*—
Macedo, Pedro B.; Simmons, Joseph H.; and Litovitz, Theodore A., 4,224,177, Cl. 252-301.10W.

Simonsen, Bent P. Fast acting explosive circuit interrupter. 4,224,487, Cl. 200-61.080.

Simpson Electric Company, a Division of American Gage & Machine Company: *See*—
Meserow, Francis P., 4,224,570, Cl. 324-175.000.

Simpson, Frank H. Primer feed device. 4,223,588, Cl. 86-45.000.

Sims, William A.: *See*—
VanHulle, Gary L.; George, Richard D.; and Sims, William A., 4,223,943, Cl. 296-224.000.

Singer, Alfred R. E., to United Kingdom of Great Britain and Northern Ireland, The Secretary for Defence in Her Britannic Majesty's Government of the. Deposition of metals on a base. 4,224,356, Cl. 427-34.000.

Singer Company, The: *See*—
Kershaw, Peter A., 4,224,047, Cl. 65-39.000.
Lovingood, James L., 4,223,744, Cl. 173-48.000.

Skakunov, Mikhail G. Storage tank. 4,223,797, Cl. 220-5.00A.

Skardal, Karl A., to Cellwood Grubbens AB. Vortex cleaner. 4,224,145, Cl. 209-211.000.

Skeels, Louis R., to G.K.L. Special Tools Limited. Valve spring remover. 4,223,431, Cl. 29-219.000.

Smeulers, Wouter: *See*—
Hovens, Paulus J. M.; Tryzna, Miloslav; Smeulers, Wouter; and Amsen, Willem H., 4,224,640, Cl. 358-242.000.

Smiel S.p.A.: *See*—
Gazzarrini, Franco; Morici, Moreno; and Trapani, Vittorio, 4,224,040, Cl. 55-71.000.

Smirnov, Evgeny A.: *See*—
Glodin, Jury N.; Eliseenko, Albert G.; Pshenichkin, Petr A.; Smirnov, Evgeny A.; Khavsky, Nikolai N.; and Kuznetsov, Lev B., 4,223,963, Cl. 308-188.000.
Smith, A. C.: *See*—
Shaw, Robert F., 4,224,303, Cl. 424-1.000.
Smith, Clay D.; and Keller, Douglas V., Jr., to Otisca Industries, Ltd. Coal briquetting methods. 4,224,039, Cl. 44-10.00R.
Smith, Eddie: *See*—
Reedy, Lonnie T.; and Smith, Eddie, 4,223,960, Cl. 308-78.000.
Smith, James D. B.; and Kauffman, Robert N., to Westinghouse Electric Corp. Fluid solventless epoxy-anhydride compositions containing metal acetylacetonate accelerators and organic carboxylic acid co-accelerators for use on an electrical member. 4,224,541, Cl. 310-45.000.
Smith, Kenneth R., to Mallinckrodt, Inc. 1-(3,5-Disubstituted-2,4,6-triiodophenly)-3-(polyhydroxy-alkyl)urea compounds. 4,224,440, Cl. 536-53.000.
Smith, Oliver W.: *See*—
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,224,369, Cl. 428-203.000.
Smith, Randlow; MacLean, John P.; Williams, Dale; Barkley, Rich W.; and Jones, Henry B., to Texaco Inc. Air distribution apparatus. 4,223,843, Cl. 239-558.000.
Smith, Thomas M. Infra-red apparatus. 4,224,018, Cl. 431-328.000.
Smith, William E., to General Electric Company. Process for the production of aldehydes and alcohols from olefinically unsaturated compounds by hydroformylation with suppression of olefin hydrogenation. 4,224,255, Cl. 568-451.000.
Smoczynski, Frank E. Color coded credit card. 4,223,918, Cl. 283-7.000.
Smolenski, Alexander J.: *See*—
Snyder, Edmund W., Jr.; and Smolenski, Alexander J., 4,224,461, Cl. 136-233.000.
Smolkin, Boris D.: *See*—
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.
Snavely, Earl S., Jr.: *See*—
Caldwell, Paul L., Jr.; and Snavely, Earl S., Jr., 4,223,735, Cl. 166-303.000.
Sneider, Vincent R. Syringe closure with attachable nozzle. 4,223,810, Cl. 222-107.000.
Sneider, Vincent R. Expandable syringe and sprinkler cap therefor. 4,223,814, Cl. 222-565.000.
SNIA Viscosa Societa' Nazionale Industria Applicazioni Viscosa S.p.A.: *See*—
Cazzaro, Giorgio; Matera, Giancarlo; Malgeri, Domenico; and Cavallaro, Antonino, 4,224,210, Cl. 260-32.60N.
Snow, Arthur: *See*—
Balcerski, James S.; Schiller, Arthur M.; and Snow, Arthur, 4,224,149, Cl. 210-705.000.
Snyder, Edmund W., Jr.; and Smolenski, Alexander J., to General Electric Company. Ungrounded three wire thermocouple. 4,224,461, Cl. 136-233.000.
S.A. Automobiles Citroen: *See*—
Largeteau, Pierre A., 4,223,485, Cl. 51-355.000.
Societe Anonyme C.E.T.I.M.: *See*—
Franssen, Jean, 4,223,573, Cl. 74-858.000.
Societe Anonyme D.B.A.: *See*—
Kervagoret, Gilbert, 4,223,694, Cl. 137-118.000.
Societe Anonyme Dite, Etablissements Genoud & Cie: *See*—
Neyret, Guy, 4,224,020, Cl. 431-344.000.
Societe Anonyme Francaise du Ferodo: *See*—
Berlioux, Jacques, 4,223,776, Cl. 192-106.200.
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,223,720, Cl. 165-14.000.
Societe d'Etude et de Construction d'Appareils de Precision (S.E.C.A.P.): *See*—
Lallemand, Jacques, 4,224,603, Cl. 340-347.00P.
Societe Dite Automobiles Peugeot: *See*—
Largeteau, Pierre A., 4,223,485, Cl. 51-355.000.
Societe National Elf Aquitaine (Production): *See*—
Carriay, Jean; and de Lautrec, Jacques, 4,223,732, Cl. 166-291.000.
Societe Nationale des Poudres et Explosifs: *See*—
Lehn, Jean-Marie; Schue, Francois; Boileau, Sylvie; Cau, Alain A.; Kaempf, Bernd; Moinard, Jean R.; and Raynal, Serge F., 4,224,429, Cl. 526-183.000.
Tillac, Jean-Francois, 4,223,916, Cl. 280-806.000.
Societe pour l'Equipement de Vehicules: *See*—
Poirier d'Ange d'Orsay, Emmanuel J.; and Paradis, Rene H., 4,223,720, Cl. 165-14.000.
Societe Suisse pour l'Industrie Horlogere Management Services, S.A.: *See*—
Jaunin, Jean-Pierre, 4,223,525, Cl. 368-113.000.
Vuilleumier, Cyril, 4,223,528, Cl. 368-220.000.
Soda, Kenji: *See*—
Kusakabe, Hitoshi; Kuninaka, Akira; and Soda, Kenji, 4,224,407, Cl. 435-25.000.
Solar, Inc.: *See*—
Schoenfelder, James L., 4,223,721, Cl. 165-104.00S.
Sollner, George H., to Phelps Dodge Industries, Inc. Water soluble essentially linear polymer having a plurality of amide, imide and ester groups therein, and a method of making the same and applying the same to substrates. 4,224,206, Cl. 260-29.20N.
Solodkov, Geny K.: *See*—
Chuguev, Jury M.; Matkova, Taisia A.; Ivanova, Svetlana A.; Solodkov, Geny K.; Pischikov, Sergei I.; Pischikov, Vsevolod I.; and Antonov, Boris M., 4,224,661, Cl. 363-71.000.
Solow, Terry S. Gliding, mechanized toothbrush. 4,223,417, Cl. 15-22.00R.
Sommer, Gordon M., to G. M. Sommer Company, Inc. Clutch unit. 4,223,774, Cl. 192-85.0AA.
Sone, Masazumi: *See*—
Suzuki, Kazuhiko; and Sone, Masazumi, 4,223,598, Cl. 98-2.110.
Sonnberger, Walter. Apparatus for descending a rope. 4,223,761, Cl. 182-5.000.
Sony Corporation: *See*—
Nakano, Kenji; and Nakamura, Tadahiko, 4,224,643, Cl. 360-70.000.
Sood, Raman R.; and Vandermeulen, Meine, to Alcan Research and Development Limited. Carbothermic production of aluminium. 4,224,059, Cl. 75-68.00A.
Sosniak, Jacob; and Unger, Burton A., to Bell Telephone Laboratories, Incorporated. Moisture level determination in sealed packages. 4,224,565, Cl. 324-65.00R.
Sotolongo, Thomas J.: *See*—
Bunnell, Edward D.; and Sotolongo, Thomas J., 4,224,464, Cl. 174-65.00R.
Southam, Frederick W., to Alcan Research and Development Limited. Process for the production of aluminium. 4,224,054, Cl. 75-10.00R.
Southam, Frederick W., to Alcan Research and Development Limited. Process for the production of aluminium. 4,224,055, Cl. 75-10.00R.
Sparber, Richard G.: *See*—
Neigh, James L.; and Sparber, Richard G., 4,224,483, Cl. 179-175.20R.
Spence, John R., to Rockwell International Corporation. One chip direct drive and keyboard sensing arrangement for light emitting diode and digitron displays. 4,224,532, Cl. 307-237.000.
Sperry Corporation: *See*—
Bean, Donald E.; Grymes, John R., Jr.; and Maine, Reuben E., 4,224,619, Cl. 343-5.0EM.
Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., 4,224,621, Cl. 343-5.0EM.
Halls, Lawrence M.; and McCarty, Horace G., 4,223,514, Cl. 56-299.000.
Kroger, Harry, 4,224,630, Cl. 357-5.000.
Nolt, Edwin B., 4,223,926, Cl. 289-10.000.
Priepke, Edward H.; and Wagstaff, Robert A., 4,223,846, Cl. 241-60.000.
Rich, Lewis C.; DiFranco, Julius V.; and Timms, Robert J., 4,224,618, Cl. 343-5.0EM.
Vansteelant, Marc G., 4,223,516, Cl. 56-343.000.
Spietschka, Ernst; Schiessler, Siegfried; and Tronich, Wolfgang, to Hoechst Aktiengesellschaft. Process for preparing copper phthalocyanine pigments of the α-modification. 4,224,222, Cl. 260-314.500.
Spin-O-Magic, Inc.: *See*—
Donnelly, James E., 4,223,576, Cl. 82-1.00C.
Spodig, Heinrich. Magnetic-technical system with a magnetic circuit comprising at least two magnets. 4,224,590, Cl. 335-306.000.
Sprain, Charles E.: *See*—
Brokke, Bruce M.; and Sprain, Charles E., 4,223,848, Cl. 242-25.00A.
Sprangle, Phillip: *See*—
Granatstein, Victor L.; Sprangle, Phillip; Drobot, Adam T.; Chu, Kwo R.; and Safter, J. Laurence, 4,224,576, Cl. 330-4.000.
Spray Safe Company, Inc.: *See*—
Williams, John E.; and Rabe, Lester H., 4,223,808, Cl. 222-88.000.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Use of 2-oxabicyclooctane derivatives in augmenting or enhancing the aroma of detergents. 4,224,176, Cl. 252-174.110.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, to International Flavors & Fragrances Inc. Chewing gum composition containing one or more 2-oxabicyclooctane derivatives. 4,224,346, Cl. 426-3.000.
SPS Technologies, Inc.: *See*—
Cadwallader, James W., 4,223,632, Cl. 118-58.000.
Staab, Thomas E.; and Larsen, James H., to Dana Corporation. Anti-stick, non-liquid absorbing gasket. 4,223,897, Cl. 277-235.00B.
Staar, S.A.: *See*—
Schatteman, Etienne A. M., 4,224,646, Cl. 360-74.200.
Stadler, Peter; Metzger, Karl G.; Petersen, Uwe; and Voss, Eckart, to Bayer Aktiengesellschaft. Pseudotrisaccharides and their medicinal use. 4,224,315, Cl. 424-180.000.
Stadnick, Steven J., to United States of America, Air Force. Hydraulic seal battery terminal. 4,224,388, Cl. 429-181.000.
Stafford, Douglas J., to Chrysler Corporation. Closure hinge mechanism. 4,223,483, Cl. 49-386.000.
Staiger, Gerhard, to BASF Aktiengesellschaft. Preparation of a titanium component for polymerization catalysts of the Ziegler-Natta type. 4,224,183, Cl. 252-429.00B.
Staiger, Gerhard, to BASF Aktiengesellschaft. Preparation of a component for polymerization catalysts. 4,224,184, Cl. 252-429.00B.
Stal Refrigeration AB: *See*—
Glanvall, Rune V., 4,224,014, Cl. 418-76.000.
Stalwart Rubber Co., The: *See*—
Lang, Ronald G., 4,223,660, Cl. 126-190.000.
Stamicarbon, B.V.: *See*—
Scholten, Joseph J. F.; and Van de Leemput, Lambertus J. M. A., 4,224,189, Cl. 252-458.000.

Stamires, Dennis: *See—*
Alafandi, Hamid; and Stamires, Dennis, 4,224,188, Cl. 252-455.00Z.

Standard Oil Company: *See—*
Talsma, Herbert; Blanchard, Charles L.; and Waggy, Anita E., 4,224,097, Cl. 156-307.300.

Standard Oil Company (Indiana): *See—*
Chen, Yu-Tsai, 4,224,214, Cl. 260-37.00N.
Hensley, Albert L., Jr.; Quick, Leonard M.; and Hopkins, P. Donald, 4,224,144, Cl. 208-216.0PP.

Standun, Inc.: *See—*
Main, Ralph M., 4,223,544, Cl. 72-45.000.

Stanton, Arthur J.; Raney, Meredith T.; and Parker, Ralph L., to Harris Corporation. Typesetting transport mechanism. 4,223,994, Cl. 355-28.000.

Stark, Gerhard; and Blum, Gunther, to Stark, Gerhard. Machine tool. 4,223,579, Cl. 82-3.000.

Stark, Karl G. C. Resilient arrangement in a ring roller allowing rings to adapt to ground irregularities. 4,223,742, Cl. 172-456.000.

Stark, Thomas F.: *See—*
Swillinger, James W.; and Stark, Thomas F., 4,224,460, Cl. 13-6.000.

Stauffer Chemical Company: *See—*
Powers, Edward J., 4,224,294, Cl. 423-309.000.
Walker, Francis H., 4,224,053, Cl. 71-118.000.

Steger, John J.: *See—*
Langer, Arthur W., Jr.; Steger, John J.; and Burkhardt, Terry J., 4,224,182, Cl. 252-429.00B.

Steigerwald, Robert L.: *See—*
Wilson, James W. A.; and Steigerwald, Robert L., 4,224,535, Cl. 307-270.000.

Stein, Charles R., to General Electric Company. Liquid crystal display. 4,224,617, Cl. 340-765.000.

Steinert, Robert B.; and Schuessler, William A., to El Paso Polyolefins Company. Injection of catalysts into a polymerization autoclave. 4,224,282, Cl. 422-111.000.

Steininger, Jacques M. Swimming pool chemical control system. 4,224,154, Cl. 210-85.000.

Stellar Industries, Inc.: *See—*
Lowe, Leonard A., 4,223,665, Cl. 126-449.000.

Stelron Cam Company: *See—*
Beezer, Earl F., 4,223,781, Cl. 198-793.000.

Stenzel, Kurt H.: *See—*
Miyata, Teruo; Rubin, Albert L.; Dunn, Michael W.; and Stenzel, Kurt H., 4,223,984, Cl. 351-160.00H.

Stepan Chemical Company: *See—*
Deutsch, Julius H., 4,224,455, Cl. 560-193.000.

Stepanov, Boris M.: *See—*
Brjukhnevich, Gennady I.; Vorobiev, Nikolai S.; Miller, Viktor A.; Postovalov, Valdis E.; Schelev, Mikhail Y.; Prokhorov, Alexandr M.; Serdjuchenko, Jury N.; Stepanov, Boris M.; Smolkin, Boris D.; Kondrashova, Lidia I.; and Lukin, Valentin F., 4,224,511, Cl. 250-213.0VT.

Sterling Drug Inc.: *See—*
Mooradian, Aram, 4,224,335, Cl. 424-274.000.

Sternberg, Robert L., to United States of America, Navy. Ellipticized lens providing balanced astigmatism. 4,224,626, Cl. 343-911.00R.

Sterner Lighting Systems Incorporated: *See—*
Guggemos, Kenneth F.; and Guggemos, Arthur R., 4,223,861, Cl. 248-222.300.

Stewart, Lygia, to University of Utah. Pit and fissure sealant for teeth. 4,224,072, Cl. 106-35.000.

Stiefel, Frank J., to Carter-Wallace, Inc. Chemical process for preparation of 7-chloro-2-methyl-3,3a-dihydro-2H,9H-isoxazolo(3,2-b)(1,3)-benzoxazin-9-one. 4,224,443, Cl. 544-95.000.

Stiles, James A. R.: *See—*
Haering, Rudolph R.; Stiles, James A. R.; and Brandt, Klaus, 4,224,390, Cl. 429-194.000.

Stocker, Lester H., to Bell & Howell Company. Automated in-line mailing system. 4,223,882, Cl. 270-21.000.

Stogryn, Eugene L.: *See—*
Klemann, Lawrence P.; and Stogryn, Eugene L., 4,224,256, Cl. 568-6.000.

Stokes, John J., Jr.; and Crooks, James H., to Aluminum Company of America. Dip brazing flux. 4,224,086, Cl. 148-26.000.

Stork, Gilbert: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,224,352, Cl. 426-538.000.

Stovba, Nikolai I.: *See—*
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.

Stover, Dennis E., to Atlantic Richfield Company. Process for the reduction of competitive oxidant consuming reactions in the solution mining of a mineral. 4,223,948, Cl. 299-4.000.

Strapex AG: *See—*
Glaus, Heinrich, 4,223,704, Cl. 140-93.400.

Strauss, Manfred, to Shelcore, Inc. Inflatable nursery toy. 4,223,474, Cl. 46-87.000.

Straussberger, Herbert; Streckel, Willi; and Riedle, Rudolf, to Wacker-Chemie GmbH. Method for reactivating a residue containing elemental silicon. 4,224,297, Cl. 423-348.000.

Streckel, Willi: *See—*
Straussberger, Herbert; Streckel, Willi; and Riedle, Rudolf, 4,224,297, Cl. 423-348.000.

Streit, Werner; Fikentscher, Rolf; Gans, Karl; Welzel, Gerhard; Glaser, Klaus; and Schaefer, Emil, to BASF Aktiengesellschaft. Water-soluble, crosslinked nitrogen-containing condensation products. 4,224,421, Cl. 525-403.000.

Streubel, Hans, to Concast AG. Segment exchanger apparatus for a continuous casting installation and method of operating the same. 4,223,715, Cl. 164-1.000.

Strom, Torsten E. T., to AB Gustavsberg. Sealing ring. 4,223,896, Cl. 277-207.00A.

Stultz, Edward B.: *See—*
Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,497, Cl. 219-121.0LM.
Grollimund, Everett C.; Duley, Walter W.; Lilly, A. Clifton, Jr.; Claflin, Warren E.; Stultz, Edward B.; and Martin, Peter, 4,224,498, Cl. 219-121.00L.

Stumpp, Gerhard: *See—*
Wessel, Wolf; Sautter, Wilfried; Engel, Gerhard; and Stumpp, Gerhard, 4,223,654, Cl. 123-358.000.

Sturm, Werner, to Von Roll AG, a part interest. Electrically welding plastic sleeve. 4,224,505, Cl. 219-544.000.

Stutzle, Dietmar: *See—*
Muller, Uno; and Stutzle, Dietmar, 4,223,607, Cl. 102-213.000.

Sudo, Tadamitsu: *See—*
Sawai, Masanobu; Sudo, Tadamitsu; and Enomoto, Shogo, 4,224,304, Cl. 424-12.000.

Sugawara, Yuji: *See—*
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, 4,224,203, Cl. 260-23.0XA.
Minagawa, Motonobu; Sekiguchi, Tetsuo; Kurita, Naoyasu; and Sugawara, Yuji, 4,224,218, Cl. 260-45.7PH.

Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, to Mitsubishi Gas chemical Company, Inc. Method for mixing raw materials for producing oxymethylene copolymers. 4,224,435, Cl. 528-232.000.

Sugiyama, Fumio; and Tashiro, Isao, to Tokyo Shibaura Denki Kabushiki Kaisha. Arithmetic operation apparatus for an electronic watthour meter. 4,224,671, Cl. 364-483.000.

Sugiyama, Takahiro, to Asahi Kogaku Kogyo Kabushiki Kaisha. Semi-wide angle photographic lens having short overall length. 4,223,982, Cl. 350-216.000.

Sugiyama, Tomoyuki; Machida, Shigeru; Kubo, Akihiro; Araki, Junichi; and Nakamura, Nobuyuki, to Honda Giken Kogyo Kabushiki Kaisha. Device for attenuating vibrations in a drive shaft of a motor vehicle. 4,223,565, Cl. 74-574.000.

Sujdak, Richard J., to Betz Laboratories, Inc. Cold end additive compositions. 4,224,180, Cl. 252-392.000.

Sukejima, Hajime: *See—*
Iwai, Hiroshi; Sukejima, Hajime; and Isozaki, Osamu, 4,224,357, Cl. 427-44.000.

Sulkowski, Theodore S.; Bergey, James L.; and Mascitti, Albert A., to American Home Products Corporation. N-[3-(lower)alkylaminopropyl]-N'-(disubstituted)phenylureas. 4,224,242, Cl. 260-553.00A.

Sullivan, Edith. Athletic briefs. 4,223,408, Cl. 2-238.000.

Sullivan, Michael R.: *See—*
Terman, David S.; Cullis, Herbert M.; Khoja, Mirza A.; and Sullivan, Michael R., 4,223,672, Cl. 128-214.00R.

Sulzer Brothers Limited: *See—*
Pfarrwaller, Erwin, 4,223,703, Cl. 139-145.000.
Riediker, Werner, 4,224,120, Cl. 204-70.000.

Sumitomo Chemical Company, Limited: *See—*
Aoyagi, Masaya; Hayashi, Mikio; Yoshida, Yasuyuki; and Yao, Yoshiaki, 4,223,412, Cl. 3-1.900.
Kanazawa, Hiroyuki; and Futagami, Mikio, 4,224,211, Cl. 260-31.20R.
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,224,344, Cl. 424-330.000.

Sumitomo Electric Industries, Ltd.: *See—*
Izawa, Tatsuo; Kuwabara, Toru; Masuda, Yuichi; and Kameo, Yuji, 4,224,046, Cl. 65-3.00A.

Sun-Heet, Inc.,: *See—*
Fattor, Arthur P., 4,223,664, Cl. 126-438.000.

Sunaga, Mamoru: *See—*
Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, 4,224,098, Cl. 156-512.000.

Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, to Sumitomo Chemical Company, Limited. Organic tricyclic compounds. 4,224,344, Cl. 424-330.000.

Sundberg, Carl-Erik W. Apparatus for smoothing transmission errors. 4,224,689, Cl. 371-6.000.

Sundstrom, Paul. Elastic band projecting toy gun. 4,223,658, Cl. 124-19.000.

Sundt, Erling; and Ohloff, Gunther, to Firmenich SA. Flavoring with certain sulphur compounds. 4,224,351, Cl. 426-535.000.

Sure Power Products, Inc.: *See—*
Scheidler, Ralph E., 4,224,562, Cl. 322-26.000.

Surratt Hosiery Mill, Inc.: *See—*
Glover, Clarence J., 4,223,816, Cl. 223-37.000.

Sustek, Alvin J., Jr.; and Frazier, Terry L., to Texaco Inc. Method of injectivity profile logging for two phase flow. 4,223,727, Cl. 166-250.000.

Suys, Andre R.; and Van Landeghem, Willy K., to AGFA-GEVAERT N.V. X-Ray image intensifying screens comprising rare-earth oxyhalide phosphor particles. 4,224,524, Cl. 250-486.000.

Suzuka, Teruo: *See—*
Fujimori, Kuniaki; Satomi, Yoshihito; Suzuka, Teruo; and Aizawa, Shirou, 4,224,140, Cl. 208-124.000.

Suzuki, Kazuhiko; and Sone, Masazumi, to Nissan Motor Company, Limited. Electronic air cleaner for passenger compartment of vehicle. 4,223,598, Cl. 98-2.110.

Suzuki, Seiichi: *See—*
Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, 4,224,108, Cl. 196-122.000.

Svedberg, Per, to ASEA Aktiebolag. Externally controlled semiconductor devices with integral thyristor and bridging FET components. 4,224,634, Cl. 357-38.000.

Swanson, James P.: *See—*
Huetsch, Larry C.; Swanson, James P.; and Nyquist, Stephen E., 4,223,766, Cl. 188-112.00R.

Sweet, Robert A.: *See—*
Faddis, Terry N.; Clifton, Kenneth C.; and Sweet, Robert A., 4,223,603, Cl. 101-138.000.

Swift & Company: *See—*
Kueper, Theodore V.; and Donnelly, Thomas H., 4,224,353, Cl. 426-576.000.

Swillinger, James W.; and Stark, Thomas F., to Libbey-Owens-Ford Company. Electrode heating device for use in glass melting furnaces. 4,224,460, Cl. 13-6.000.

Swim 'N Play, Inc.: *See—*
Ventrice, Raymond, 4,223,498, Cl. 52-249.000.

Swing Stage Limited: *See—*
Dunlop, Dean A., 4,223,629, Cl. 114-263.000.

Swiss Aluminium Ltd.: *See—*
Jaquet, Jean-Claude; Heckler, Manfred; and Zoller, Heinrich, 4,224,065, Cl. 75-139.000.
Schmidt-Hatting, Wolfgang, 4,224,127, Cl. 204-243.00M.
Schrade, Jean, 4,223,798, Cl. 220-66.000.
Wagner, Alfred; and Ames, Adolf, 4,223,546, Cl. 72-253.00A.
Wagner, Alfred; and Ames, Adolf, 4,223,548, Cl. 72-265.000.

Swoboda, Johann; Lindenschmidt, Gerhard; and Bernhard, Claus, to BASF Aktiengesellschaft. Weathering-resistant, high-impact, easily colored thermoplastic compositions. 4,224,419, Cl. 525-71.000.

Syntex (U.S.A.) Inc.: *See—*
Dvorak, Charles A.; and Beard, Colin C., 4,224,224, Cl. 260-340.50R.

Szarka, Jay R. Sound activated temperature control system. 4,223,831, Cl. 236-47.000.

Szegvari, Andrew, to Union Process International, Inc. Method for making chocolate and chocolate flavored materials. 4,224,354, Cl. 426-584.000.

Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. 3-(1-Pyrazolyl)-pyridazine derivatives and hypotensive compositions thereof. 4,224,325, Cl. 424-250.000.

Szucs, Stephen S., to American Cyanamid Company. Polysubstituted butanoic acids, esters and derivatives thereof utilizing the same as herbicides. 4,224,052, Cl. 71-105.000.

Tabak, Samuel A.: *See—*
Morrison, Roger A.; and Tabak, Samuel A., 4,224,141, Cl. 208-134.000.

Tabata, Kinji: *See—*
Kunimatsu, Hiroshi; Tabata, Kinji; Koreeda, Kiyoshi; and Daido, Toshihiko, 4,223,616, Cl. 112-158.00E.

Tabor, Joseph A., to Russell, Burdsall & Ward Corporation. Self-locking fastener. 4,223,711, Cl. 151-37.000.

Tachikawa, Kyoji; and Sekine, Hisashi, to National Research Institute for Metals. Method for producing Nb_3Sn superconductor. 4,224,087, Cl. 148-133.000.

Tackitt, Coy C. Slopeboard mounting. 4,223,461, Cl. 37-105.000.

Taggart, John K., to Plastilite Corporation. Fishing rod holder. 4,223,791, Cl. 211-120.000.

Taiho Pharmaceutical Company: *See—*
Honna, Takaji; Tanaka, Motoaki; Yamada, Syozo; and Miyake, Hidekazu, 4,224,450, Cl. 548-248.000.

Takada, Naoki: *See—*
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.

Takada, Shunji; Akimura, Yoshitaka; Mifune, Hiroyuki; and Tsujino, Nobuyuki, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsions and image forming process. 4,224,401, Cl. 430-437.000.

Takagi, Shunichi: *See—*
Nishio, Kanemitsu; Takagi, Shunichi; and Yoshida, Mitsutaka, 4,224,554, Cl. 315-53.000.

Takagi, Yuichi: *See—*
Tanaka, Teruaki; Kaizuka, Masao; Takagi, Yuichi; and Aihara, Mitsuo, 4,223,526, Cl. 368-84.000.

Takahama, Teizo; Kazama, Toyoki; and Hieda, Tatumi, to Fuji Electric Co., Ltd. Carbon monoxide detecting apparatus. 4,223,550, Cl. 73-23.000.

Takahama, Teizo; and Kazama, Toyoki, to Fuji Electric Co., Ltd. Carbon monoxide detecting device. 4,224,280, Cl. 422-98.000.

Takahashi, Hisao; Nomura, Takeshi; Ozaki, Kiyoji; Izumida, Haruo; Miwa, Naotaka; Kawabe, Naoshi; Shigeta, Masatomo; Hozuma, Hiroshi; and Suzuki, Seiichi, to Kureha Kagaku Kogyo Kabushiki Kaisha. Decoking apparatus. 4,224,108, Cl. 196-122.000.

Takahashi, Nobuo; Uchiyama, Masanobu; Futami, Takaaki; and Imamiya, Yoji, to Ihara Chemical Industry Co., Ltd. Process for preparation of carbonyl sulfide. 4,224,300, Cl. 423-416.000.

Takahashi, Shuji, to Showa Denko K.K. Cathode. 4,224,133, Cl. 204-290.00R.

Takahashi, Takashi: *See—*
Okuma, Hideo; Takahashi, Takashi; Yamashita, Yohachi; and Furukawa, Osamu, 4,224,174, Cl. 252-62.900.

Takamizawa, Shouzi: *See—*
Maekawa, Iwao; Uchigasaki, Isao; Takamizawa, Shouzi; and Kageyama, Akira, 4,224,430, Cl. 526-282.000.

Takao, Hiroshi: *See—*
Kimura, Shinji; Takao, Hiroshi; Ishitani, Shigeo; Ikezawa, Kenji; and Aoki, Hiroyuki, 4,224,113, Cl. 204-1.00T.

Takeda Chemical Industries, Ltd.: *See—*
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, 4,224,441, Cl. 544-16.000.

Takeda, Mutsuhiko: *See—*
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.

Takeda, Reiji: *See—*
Oikawa, Shozo; Takeda, Reiji; Sunaga, Mamoru; Kawatsu, Yoshiyuki; and Sakaki, Michinori, 4,224,098, Cl. 156-512.000.

Takeda, Susumu; Hazama, Kiyoaki; and Ichitsuka, Nobuo, to Konishiroku Photo Industry Co. Ltd. Release device in a camera equipped with self-cocking mechanism. 4,223,992, Cl. 354-266.000.

Takenouchi, Mutsuo; and Ozawa, Takashi, to Fuji Xerox Co., Ltd. Original document reading apparatus. 4,224,510, Cl. 250-207.000.

Takesue, Edward I., to Sandoz, Inc. Methods with 1-substituted-4-arylquinazolin-2(1H)-ones and thiones and pyrido[2,3-d]pyrimidin-2-ones as platelet aggregation inhibitors. 4,224,328, Cl. 424-251.000.

Talsma, Herbert; Blanchard, Charles L.; and Waggy, Anita E., to Standard Oil Company. Solvent bonding of high acrylonitrile copolymers. 4,224,097, Cl. 156-307.300.

Tamburro, Peter J., to Bell Telephone Laboratories, Incorporated. Circuit board keying arrangement. 4,223,973, Cl. 339-186.00M.

Tamulis, John C., to International Business Machines Corporation. Low energy magnetic actuator. 4,224,589, Cl. 335-237.000.

Tanabe Seiyaku Co., Ltd.: *See—*
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; Watanabe, Taizo; and Fujimura, Motoki, 4,224,411, Cl. 435-177.000.

Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt system. 4,223,915, Cl. 280-804.000.

Tanaka, Hidetsugu: *See—*
Kyo, Sunao; Tsuchiya, Haruo; and Tanaka, Hidetsugu, 4,224,252, Cl. 568-388.000.

Tanaka, Katsumasa: *See—*
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.

Tanaka, Motoaki: *See—*
Honna, Takaji; Tanaka, Motoaki; Yamada, Syozo; and Miyake, Hidekazu, 4,224,450, Cl. 548-248.000.

Tanaka, Satoru C., to Reticon Corporation. Methods and apparatus for compensating for charge transfer inefficiency in imaging and other variable length charge transfer devices. 4,224,585, Cl. 333-165.000.

Tanaka, Shinpei: *See—*
Nishimoto, Keiji; and Tanaka, Shinpei, 4,224,089, Cl. 148-187.000.

Tanaka, Teruaki; Kaizuka, Masao; Takagi, Yuichi; and Aihara, Mitsuo, to Tokyo Shibaura Electric Co., Ltd. Electronic timepiece. 4,223,526, Cl. 368-84.000.

Tanaka, Yoko: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,224,231, Cl. 260-397.200.

Tanguy, Denis R.; and Leising, Larry J., to Schlumberger Technology Corporation. Shock limiting apparatus. 4,223,746, Cl. 175-40.000.

Tantalo, Lawrence; Traver, Robert H.; and Lyons, William E., to Bauer Bros. Co., The. Coaxial feeder. 4,223,847, Cl. 241-247.000.

Tapecon, Inc.: *See—*
Good, David M., 4,223,463, Cl. 40-158.00R.

Tardos, Laszlo: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Tashiro, Isao: *See—*
Sugiyama, Fumio; and Tashiro, Isao, 4,224,671, Cl. 364-483.000.

Tashiro, Makoto: *See—*
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,224,632, Cl. 357-17.000.

Tashiro, Yasuhisa; Nagashima, Takashi; Aoki, Shigeru; and Nishizawa, Rinzo, to Nippon Kayaku Kabushiki Kaisha. Process for preparing optically active amino acid or mandelic acid. 4,224,239, Cl. 260-501.110.

Tauber, Arthur: *See—*
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,224,067, Cl. 75-170.000.

Taylor, Lynn J.; and Tobias, John W., to Owens-Illinois, Inc. Degradable plastic composition containing amine. 4,224,416, Cl. 521-94.000.

Taylor, Norman J., to Varian Associates, Inc. Multistage cylindrical mirror analyzer incorporating a coaxial electron gun. 4,224,518, Cl. 250-305.000.

Taylor, Stephen, to Power-Lite Industries, Inc. Rechargeable battery pack. 4,224,383, Cl. 429-7.000.

TDK Electronics Co., Ltd.: *See—*
Yoshizawa, Keiichi, 4,223,613, Cl. 108-64.000.

TEAC Corporation: *See—*
Mawatari, Akinori; Yamaguchi, Hirohisa; Nakamura, Kenji; and Uchiumi, Satoshi, 4,224,642, Cl. 360-32.000.

Teafilter International A/PS: *See—*
Tragardh, Jan, 4,224,168, Cl. 210-470.000.

Tear, Brian J.: *See—*
Chambers, Hubert H.; and Tear, Brian J., 4,224,080, Cl. 106-308.00Q.

Teasdale, Thomas S.; and Adams, Wilton T., to Texaco Inc. Method for reservoir fluid drift rate determination. 4,223,725, Cl. 166-250.000.

Tektronix, Inc.: *See—*
Kawabata, Frederick Y.; and Wane, William M., 4,223,968, Cl. 339-14.00R.

Telford, Thomas M., to Warn Industries, Inc. Semi-automatic roller locking clutch. 4,223,772, Cl. 192-48.600.

Telina, Larisa A.: *See—*
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.

Templeton, William B., to Burroughs Corporation. Guide arm assembly. 4,223,885, Cl. 271-220.000.

Tennison, Stephen R.: *See—*
Foster, Alan I.; McCarroll, John J.; and Tennison, Stephen R., 4,224,192, Cl. 252-466.00B.

Tenti, Roberto: *See—*
Mazzucato, Fabio; and Tenti, Roberto, 4,223,622, Cl. 114-74.00R.

Terman, David S.; Cullis, Herbert M.; Khoja, Mirza A.; and Sullivan, Michael R., to Baxter Travenol Laboratories, Inc. Variable volume plasma treatment chamber for an apparatus for the extracorporeal treatment of disease. 4,223,672, Cl. 128-214.00R.

Termoneccanica Italiana S.p.A.: *See—*
Grandi, Attilio, 4,224,009, Cl. 415-168.000.

Ternovoi, Anatoly I.: *See—*
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.

Terrell, Mark C., to United States of America, Air Force. High accuracy optical shaft encoder system. 4,224,515, Cl. 250-231.05E.

Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,224,227, Cl. 260-347.400.

Tetra Pack Developpement S.A.: *See—*
Reil, Wilhelm, 4,223,789, Cl. 206-605.000.

Texaco Development Corp.: *See—*
Cavitt, Stanley B., 4,224,194, Cl. 252-476.000.

Texaco Inc.: *See—*
Barber, Everett M.; Muenger, James R.; and Alexander, David L., 4,224,299, Cl. 423-360.000.
Bodor, Edward E.; and Payton, Joy T., 4,223,733, Cl. 166-293.000.
Estes, John H.; and Buinicky, Ernest P., 4,223,731, Cl. 166-272.000.
Haugen, Haakon, 4,224,170, Cl. 252-32.70E.
Mayer, Edward A., 4,224,285, Cl. 422-179.000.
Mazzucato, Fabio; and Tenti, Roberto, 4,223,622, Cl. 114-74.00R.
McGahey, Dean C., 4,223,706, Cl. 141-59.000.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,224,673, Cl. 364-501.000.
Sequeira, Avilino, Jr.; and Barger, Frank L., 4,224,674, Cl. 364-501.000.
Smith, Randlow; MacLean, John P.; Williams, Dale; Barkley, Rich W.; and Jones, Henry B., 4,223,843, Cl. 239-558.000.
Sustek, Alvin J., Jr.; and Frazier, Terry L., 4,223,727, Cl. 166-250.000.
Teasdale, Thomas S.; and Adams, Wilton T., 4,223,725, Cl. 166-250.000.

Texas Instruments Incorporated: *See—*
Appelt, Daren R., 4,224,676, Cl. 364-712.000.
Penz, Perry A., 4,224,615, Cl. 340-712.000.
Senor, Ronald E., 4,224,591, Cl. 337-102.000.

Tezuka, Shichigoro; and Shibata, Masaki, to Lotte Co., Ltd. Chewing gum base and a combination of a chewing gum with fatty matter. 4,224,345, Cl. 426-3.000.

Th. Kieserling & Albrecht: *See—*
Goeke, Alfons; Hartkopf, Heinz; Tuckmantel, Eberhand; and Schweer, Wilhelm, 4,223,578, Cl. 82-1.00C.
Seppelt, Bernhard, 4,223,577, Cl. 82-1.00C.

Therm - Air Industries, Inc.: *See—*
Livezey, David J., 4,223,659, Cl. 126-66.000.

Thiel, Max: *See—*
Fauland, Erich; Kampe, Wolfgang; Thiel, Max; Dietmann, Karl; and Juhran, Wolfgang, 4,224,438, Cl. 536-26.000.

Thiele, Geraldine H. Retardation of the putrefaction of hides and skins. 4,224,028, Cl. 8-94.180.

Thiele, Geraldine H.; and Yankell, Samuel L., to Oxford Hill, Ltd. Mouthwash and methods. 4,224,307, Cl. 424-49.000.

Thieme, Roland; and Heyneman, Guido, to Siemens Aktiengesellschaft. Dosaging device for liquid media. 4,224,281, Cl. 422-100.000.

Thomas & Betts Corporation: *See—*
Rockwell, Kenneth N., 4,224,690, Cl. 371-25.000.

Thomas, Daniel C.: *See—*
Muzyczko, Thaddeus M.; and Thomas, Daniel C., 4,224,398, Cl. 430-175.000.

Thompson, Jack E. Fluid flow intensifier for tide, current or wind generator. 4,224,527, Cl. 290-54.000.

Thompson, Kenneth P.; Ihde, Richard C.; and Roth, Clarence E., to Champion International Corporation. Method for making all-plastic heat-sealable container. 4,224,092, Cl. 156-82.000.

Thompson, Paul A.: *See—*
Kirch, William; and Thompson, Paul A., 4,224,428, Cl. 526-106.000.

Thomson-CSF: *See—*
Charransol, Pierre; Athenes, Claude; and Salle, Jacques, 4,224,475, Cl. 370-59.000.
Gendreu, Robert, 4,224,507, Cl. 235-412.000.
Houdart, Michel, 4,224,584, Cl. 333-116.000.
Michaud, Claude; and Fontanes, Sylvain, 4,224,605, Cl. 340-347.0AD.
Papuchon, Michel; and Puech, Claude, 4,223,977, Cl. 350-96.110.

Thorngate, John H.: *See—*
Gammage, Richard B.; Thorngate, John H.; and Christian, Danny J., 4,224,519, Cl. 250-337.000.

Tietze, Jurgen: *See—*
zu Kocker, Heinz M.; and Tietze, Jurgen, 4,224,136, Cl. 208-8.0LE.

Tijburg, Rudolf P.; and Damen, Cornelus P. T. M., to U.S. Philips Corporation. Method of manufacturing semiconductor devices using laser beam cutting. 4,224,101, Cl. 156-643.000.

Tillac, Jean-Francois, to Societe Nationale des Poudres et Explosifs. Traction device for safety belts. 4,223,916, Cl. 280-806.000.

Time Saving Falls, Inc.: *See—*
Eyster, Charles G.; and Bissell, Holbrook C., 4,223,799, Cl. 220-230.000.

Timms, Robert J.: *See—*
Rich, Lewis C.; DiFranco, Julius V.; and Timms, Robert J., 4,224,618, Cl. 343-5.0EM.

Titus, Paul E., to Shell Oil Company. Additives to improve the pipeline transportation of cold water slurries. 4,223,691, Cl. 137-13.000.

Tobias, John W.: *See—*
Taylor, Lynn J.; and Tobias, John W., 4,224,416, Cl. 521-94.000.

Tobin, John H.; Gay, Walter A.; and Katz, Lawrence E., to Olin Corporation. Biuret derivatives of 3-trihalomethyl-1,2,4-thiadiazoles. 4,224,449, Cl. 548-128.000.

Tobita, Katsumi: *See—*
Yoshisato, Akiyuki; and Tobita, Katsumi, 4,224,580, Cl. 331-116.00R.

Tocco-Stel: *See—*
Reboux, Jean; and Guilloteau, Joel, 4,224,494, Cl. 219-9.500.

Toda, Yuzo; Adachi, Keiichi; Ishiguro, Shoji; and Nakayama, Yasuhiro, to Fuji Photo Film Co., Ltd. Method for preventing the degradation of a hydrophilic colloid solution for silver halide photographic light-sensitive material. 4,224,403, Cl. 430-537.000.

Todd, John A.: *See—*
Caswell, Richard L.; and Todd, John A., 4,223,807, Cl. 222-28.000.

Toko, Inc.: *See—*
Iguchi, Yasuhide, 4,224,659, Cl. 363-20.000.

Tokyo Shibaura Denki Kabushiki Kaisha: *See—*
Iwamoto, Masami; Tashiro, Makoto; Beppu, Tatsuro; and Kasami, Akinobu, 4,224,632, Cl. 357-17.000.
Komatsu, Shigeru; and Inoue, Hiroshi, 4,224,088, Cl. 148-187.000.
Okuma, Hideo; Takahashi, Takashi; Yamashita, Yohachi; and Furukawa, Osamu, 4,224,174, Cl. 252-62.900.
Sasaki, Masayuki; Oida, Yoshio; and Semi, Hidetoshi, 4,224,685, Cl. 364-900.000.
Sugiyama, Fumio; and Tashiro, Isao, 4,224,671, Cl. 364-483.000.

Tokyo Shibaura Electric Co., Ltd.: *See—*
Tanaka, Teruaki; Kaizuka, Masao; Takagi, Yuichi; and Aihara, Mitsuo, 4,223,526, Cl. 368-84.000.
Watanabe, Hiroshi; Endoh, Kenjiro; Ohkawa, Motokazu; Kitagawa, Kazuo; and Kira, Hideshi, 4,224,581, Cl. 333-14.000.
Yonezawa, Toshio; Ajima, Takashi; and Uchida, Masato, 4,224,636, Cl. 357-54.000.

Tolnay, Pal: *See—*
Szilagyi, Geza; Kasztreiner, Endre; Tardos, Laszlo; Kosa, Edit; Jaszlits, Laszlo; Cseh, Gyorgy; Kovacs, Ilona, nee Szabo; Tolnay, Pal; Elek, Sandor; Elekes, Istvan; and Polgari, Istvan, 4,224,325, Cl. 424-250.000.

Tomizawa, Fumio; Sezaki, Kazuo; Shimizu, Makoto; and Katahashi, Yukinaga, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Direct reduction process for iron ores with fluidized bed system. 4,224,056, Cl. 75-11.000.

Tomy Kogyo Co., Inc.: *See—*
Konta, Yukio, 4,223,889, Cl. 273-127.00R.

Tone, Junsuke: *See—*
Celmer, Walter D.; Watts, Paul C.; Cullen, Walter P.; Huang, Liang H.; Shibakawa, Riichiro; and Tone, Junsuke, 4,224,314, Cl. 424-122.000.

Topham, Arthur, to Imperial Chemical Industries Limited. Dispersing agents, dispersions containing these agents and paints and inks made from the dispersions. 4,224,212, Cl. 260-33.60R.

Toro Company, The: *See—*
Petersen, Walter J., 4,223,771, Cl. 192-10.000.

Tosa, Tetsuya: *See*—
Chibata, Ichiro; Tosa, Tetsuya; Mori, Takao; Watanabe, Taizo; and Fujimura, Motoki, 4,224,411, Cl. 435-177.000.
Toussaint, Herbert: *See*—
Mueller, Herbert; Toussaint, Herbert; and Wittwer, Arnold, 4,224,251, Cl. 260-584.00R.
Toyo Seikan Kaisha, Ltd.: *See*—
Ichinose, Isao; Mori, Fumio; and Kunimoto, Go, 4,224,379, Cl. 428-461.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Mori, Mamoru; Sasaki, Shiro; and Kinaga, Eiichi, 4,223,917, Cl. 280-806.000.
Muramatsu, Tadao; and Fujiwara, Katsuhiro, 4,223,951, Cl. 301-37.0PB.
Nogami, Tomoyuki, 4,223,956, Cl. 303-24.00C.
Nohira, Hidetaka; Ito, Sumio; Kumai, Teruo; and Oki, Hisashi, 4,223,645, Cl. 123-292.000.
Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,223,915, Cl. 280-804.000.
Tragardh, Jan, to Teafilter International A/PS. Holder for filter bags. 4,224,168, Cl. 210-470.000.
Trak Incorporated: *See*—
Danner, William D.; and Woitschatzke, Hans, 4,223,909, Cl. 280-604.000.
Trampusch, Adolf: *See*—
Hertel, Hasso; and Trampusch, Adolf, 4,224,027, Cl. 8-666.000.
Trane Company, The: *See*—
Sanborn, Duane F.; and Ware, Chester D., 4,223,537, Cl. 62-174.000.
Webb, Ralph L.; and Mougin, Louis J., 4,223,539, Cl. 62-476.000.
Trans World Technology Laboratories Inc. (TWT Labs, Inc.): *See*—
Zweig, Gilbert, 4,224,397, Cl. 430-157.000.
TransFRESH Corporation: *See*—
Woodruff, Richard E., 4,224,347, Cl. 426-106.000.
Trapani, Vittorio: *See*—
Gazzarrini, Franco; Morici, Moreno; and Trapani, Vittorio, 4,224,040, Cl. 55-71.000.
Traut, Donald P., to Helix Technology Corporation. Filter apparatus for removing contaminants from a fluid stream having improved withdrawal means for spent adsorbent. 4,224,147, Cl. 210-660.000.
Trautmann, Karl-Heinz: *See*—
Bachmann, Volker; Nowack, Horst; and Trautmann, Karl-Heinz, 4,223,443, Cl. 33-148.00D.
Traver, Robert H.: *See*—
Tantalo, Lawrence; Traver, Robert H.; and Lyons, William E., 4,223,847, Cl. 241-247.000.
Traynor, Sean G.: *See*—
Kane, Bernard J.; and Traynor, Sean G., 4,224,240, Cl. 260-503.000.
Trecker, David J.: *See*—
Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,224,369, Cl. 428-203.000.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Vock, Manfred H.; Luccarelli, Domenick, Jr.; Schmitt, Frederick L.; Stork, Gilbert; MacDonald, Timothy; and Liberman, Arthur L., 4,224,352, Cl. 426-538.000.
Trick, William T.: *See*—
Margison, Arthur D.; and Trick, William T., 4,224,526, Cl. 290-52.000.
Trinchieri, Mario G., to Honeywell Information Systems Inc. Apparatus for detecting when the activity of one process in relation to a common piece of information interferes with any other process in a multiprogramming/multiprocessing computer system. 4,224,664, Cl. 364-200.000.
Trio Kabushiki Kaisha: *See*—
Muto, Yasuhiko, 4,224,556, Cl. 315-396.000.
Tronich, Wolfgang: *See*—
Spietschka, Ernst; Schiessler, Siegfried; and Tronich, Wolfgang, 4,224,222, Cl. 260-314.500.
TRW Inc.: *See*—
Kinder, Mark R., 4,223,646, Cl. 123-41.110.
Tryastsina, Anna I.: *See*—
Olifer, Vladimir P.; Berezkin, Sergei P.; Galkin, Pavel N.; Ternovoi, Anatoly I.; Rogatkin, Alexandr A.; Stovba, Nikolai I.; Feofanov, Lev P.; Khlopkov, Leonid P.; Tryastsina, Anna I.; Lekalova, Lidia I.; Telina, Larisa A.; and Mikheeva, Vera I., 4,224,077, Cl. 106-100.000.
Tryom, Inc.: *See*—
Shane, Tim A.; and O'Hara, Gary J., 4,223,893, Cl. 273-237.000.
Tryzna, Miloslav: *See*—
Hovens, Paulus J. M.; Tryzna, Miloslav; Smeulers, Wouter; and Amsen, Willem H., 4,224,640, Cl. 358-242.000.
Tsang, Wing; Walker, James A.; and Cornell, Douglas W., to United States of America, Commerce. Reactive gas generator. 4,224,279, Cl. 422-78.000.
Tse, Woon W. Process for biconstituent polymer compositions. 4,224,271, Cl. 264-184.000.
Tsuchiya, Haruo: *See*—
Kyo, Sunao; Tsuchiya, Haruo; and Tanaka, Hidetsugu, 4,224,252, Cl. 568-388.000.
Tsuda, Hiroshi; and Miyashita, Kiyoshi, to Olympus Optical Co., Ltd. Electrophotographic apparatus. 4,223,993, Cl. 355-3.00R.
Tsujino, Nobuyuki: *See*—
Takada, Shunji; Akimura, Yoshitaka; Mifune, Hiroyuki; and Tsujino, Nobuyuki, 4,224,401, Cl. 430-437.000.
Tsujiuchi, Yoshio: *See*—
Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,223,915, Cl. 280-804.000.
Usami, Susumu; Asai, Toshiaki; and Tsujiuchi, Yoshio, 4,223,914, Cl. 280-803.000.
Tsushima, Susumu; Sendai, Michiyuki; Shiraishi, Mitsuru; and Matsumoto, Norichika, to Takeda Chemical Industries, Ltd. Derivatives of 7-aminocephalosporanic acid. 4,224,441, Cl. 544-16.000.
Tucholski, George T. Swaging tool assembly. 4,223,545, Cl. 72-206.000.
Tucker, Terry A.: *See*—
Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., 4,224,621, Cl. 343-5.0EM.
Tuckmantel, Eberhand: *See*—
Goeke, Alfons; Hartkopf, Heinz; Tuckmantel, Eberhand; and Schweer, Wilhelm, 4,223,578, Cl. 82-1.00C.
Tuhy, Frank P., Jr., to Bell Telephone Laboratories, Incorporated. Multiparty subscriber loop carrier systems. 4,224,476, Cl. 179-17.00E.
Tuhy, Frank P., Jr.: *See*—
Goldthorp, David C.; and Tuhy, Frank P., Jr., 4,224,654, Cl. 361-152.000.
Tummala, Rao R.: *See*—
Powell, Jimmie L.; and Tummala, Rao R., 4,224,627, Cl. 346-75.000.
Turak, John L., to Bendix Corporation, The. Drum brake having pawl and lever. 4,223,765, Cl. 188-79.50P.
Turillon, Pierre P.: *See*—
Brendel, Thomas A.; and Turillon, Pierre P., 4,224,085, Cl. 148-11.50P.
Tutiya, Hidetaka; and Waki, Masahiko, to Citizen Watch Co., Ltd. Retaining spring for a wristwatch case. 4,223,527, Cl. 368-283.000.
Tyco Industries, Inc.: *See*—
Meyer, Ronald W.; and Jackman, Robert A., 4,223,476, Cl. 46-257.000.
Ube Industries, Ltd.: *See*—
Murase, Tamotsu; Fujimoto, Shintaro; Kasuga, Yukinori; Takada, Naoki; Sasaki, Hajime; and Miwa, Nobuo, 4,224,286, Cl. 422-205.000.
Umemura, Sumio; Matsui, Kanenobu; Koga, Kunitoshi; and Kuniyoshi, Mineo, 4,224,456, Cl. 560-241.000.
Uchida, Masato: *See*—
Yonezawa, Toshio; Ajima, Takashi; and Uchida, Masato, 4,224,636, Cl. 357-54.000.
Uchida, Mitsuo; Okano, Takeshi; Matsushita, Kunichi; Oguri, Yasuo; Saito, Junji; and Kaneko, Takao, to Mitsubishi Chemical Industries, Limited. Catalytic reduction of nitrogen oxides. 4,224,292, Cl. 423-239.000.
Uchida, Toshio: *See*—
Noguchi, Yasuhiro; Kondo, Syunichi; Matsufuji, Akihiro; Ono, Hisatake; and Uchida, Toshio, 4,224,225, Cl. 260-346.710.
Uchidoi, Masanori: *See*—
Shimizu, Masami; Uchidoi, Masanori; Date, Nobuaki; and Aizawa, Hiroshi, 4,223,987, Cl. 354-23.00D.
Uchigasaki, Isao: *See*—
Maekawa, Iwao; Uchigasaki, Isao; Takamizawa, Shouzi; and Kageyama, Akira, 4,224,430, Cl. 526-282.000.
Uchiumi, Satoshi: *See*—
Mawatari, Akinori; Yamaguchi, Hirohisa; Nakamura, Kenji; and Uchiumi, Satoshi, 4,224,642, Cl. 360-32.000.
Uchiyama, Masanobu: *See*—
Takahashi, Nobuo; Uchiyama, Masanobu; Futami, Takaaki; and Imamiya, Yoji, 4,224,300, Cl. 423-416.000.
Uchiyama, Yasuji: *See*—
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,223,584, Cl. 84-1.170.
Ueda, Akio; and Akita, Shuichi, to Nippon Zeon Co. Ltd. Rubber composition for tire tread. 4,224,197, Cl. 260-5.000.
Uekusa, Hiroshi, to Yoshino Kogyosho Co., Ltd. Method for controlling parison wall thickness and a wall thickness control signal generator circuit for carrying out the method. 4,224,560, Cl. 318-603.000.
Ulbing, Otmar M., to Columbus McKinnon Corporation. Hoist test stand. 4,223,554, Cl. 73-133.00R.
Umemura, Sumio; Matsui, Kanenobu; Koga, Kunitoshi; and Kuniyoshi, Mineo, to Ube Industries, Ltd. Process for preparing aliphatic monocarboxylic acid ester of hydroxymethyl-substituted monoaromatic compound. 4,224,456, Cl. 560-241.000.
Umenura, Toshikazu: *See*—
Sugio, Akitoshi; Amamiya, Akira; Kunii, Tadashi; Furusawa, Tomotaka; Takeda, Mutsuhiko; Tanaka, Katsumasa; Umenura, Toshikazu; and Kawaguchi, Kiyokazu, 4,224,435, Cl. 528-232.000.
Umezawa, Hiroyuki; Ito, Masao; and Okada, Hitoshi, to Clarion Co., Ltd. Magnetic tape-record/playback apparatus. 4,224,647, Cl. 360-96.300.
Unger, Burton A.: *See*—
Sosniak, Jacob; and Unger, Burton A., 4,224,565, Cl. 324-65.00R.
Unger, Walter: *See*—
Backstein, Guenter; and Unger, Walter, 4,223,608, Cl. 102-244.000.
Unimation, Inc.: *See*—
Lindbom, Torsten H.; and Munger, Donald W., 4,224,501, Cl. 219-124.340.
Union Carbide Corporation: *See*—
Beisner, Robert W.; and Winans, Stephen C., 4,224,235, Cl. 260-449.00L.
Bilek, Paul J.; Henning, William A.; McCluhan, Thomas K.; and Dong, Julian M., 4,224,064, Cl. 75-130.00R.

Borden, George W.; Smith, Oliver W.; and Trecker, David J., 4,224,369, Cl. 428-203.000.
Brown, Harry J.; and Chopra, Kuldip S., 4,224,382, Cl. 428-656.000.
DeMatos, Henrique V.; and Piper, John, 4,224,656, Cl. 361-433.000.
Kaplan, Leonard, 4,224,237, Cl. 260-449.00L.
Kozawa, Akiya; and Kordesch, Karl V., 4,224,384, Cl. 429-57.000.
McGill, William C., 4,224,099, Cl. 156-605.000.
Olszewski, Walter J.; and Ziemer, John H., 4,224,045, Cl. 62-30.000.

Union Oil Company of California: *See*—
Jost, John W., 4,224,151, Cl. 210-696.000.

Union Process International, Inc.: *See*—
Szegvari, Andrew, 4,224,354, Cl. 426-584.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary for Defence in Her Britannic Majesty's Government of the: *See*—
Singer, Alfred R. E., 4,224,356, Cl. 427-34.000.

United States Gypsum Company: *See*—
Wendt, Alan C., 4,223,494, Cl. 52-211.000.

United States of America
Agriculture: *See*—
Reinhardt, Robert M.; and Kullman, Russell M. H., 4,224,030, Cl. 8-115.700.
Air Force: *See*—
Hays, Wilbur L., 4,224,558, Cl. 318-314.000.
O'Connell, Robert M., 4,224,548, Cl. 310-360.000.
O'Connell, Robert M., 4,224,549, Cl. 310-360.000.
Poirier, J. Leon; Rao, Kotcherlakota V. N.; and Poles, Livio D., 4,224,607, Cl. 340-552.000.
Stadnick, Steven J., 4,224,388, Cl. 429-181.000.
Terrell, Mark C., 4,224,515, Cl. 250-231.0SE.
Army: *See*—
Rothwarf, Frederick; Bergner, Robert L.; Leupold, Herbert A.; and Tauber, Arthur, 4,224,067, Cl. 75-170.000.
Commerce: *See*—
Tsang, Wing; Walker, James A.; and Cornell, Douglas W., 4,224,279, Cl. 422-78.000.
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Gammage, Richard B.; Thorngate, John H.; and Christian, Danny J., 4,224,519, Cl. 250-337.000.
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Pemberton, Mark S.; and Crawford, Steven D., 4,224,410, Cl. 435-162.000.

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Upatnieks, Juris, to Environmental Research Institute of Michigan. Aberration correction of magnified holographic images. 4,223,975, Cl. 350-3.680.

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Usami, Susumu; Asai, Toshiaki; and Tsujiuchi, Yoshio, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Seatbelt system. 4,223,914, Cl. 280-803.000.

Usui Kokusai Sangyo Kabushiki Kaisha: *See*—
Usui, Masayoshi, 4,223,826, Cl. 228-208.000.

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Van Bilderbeek, Bernard H., to Vetco, Inc. Vertically retrievable subsea conduit connector. 4,223,920, Cl. 285-24.000.

Van Blanton, M.; and Scallet, Barrett L., to Anheuser-Busch, Incorporated. Method for producing water soluble corn protein derivatives by reacting with alkylene oxide. 4,224,219, Cl. 260-112.00G.

Van de Leemput, Lambertus J. M. A.: *See*—
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Vanderspurt, Thomas H., to Celanese Corporation. Olefin oxidation catalyst and process for its preparation. 4,224,187, Cl. 252-437.000.

Vanderspurt, Thomas H., to Celanese Corporation. Olefin oxidation catalyst and process for its preparation. 4,224,193, Cl. 252-468.000.

Vanderveen, John W.; and Malick, Emil A., to Phillips Petroleum Company. Fermentation apparatus and method. 4,224,414, Cl. 435-313.000.

Van Gaasbeek, Richard; and Britton, Robert W. Golf stroke analyzer. 4,223,891, Cl. 273-186.00R.

VanHulle, Gary L.; George, Richard D.; and Sims, William A., to American Sunroof Corporation. Positioning device for removable vehicle roof panels. 4,223,943, Cl. 296-224.000.

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Van Liempd, Albertus C. H.: *See*—
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van Lit, Klass J., to S. C. Johnson & Son, Inc. Wall mounted receptacle for aerosol cans. 4,223,812, Cl. 222-180.000.

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Van Scott, Eugene J.; and Yu, Ruey J. Treatment of disturbed keratinization. 4,224,339, Cl. 424-289.000.

Vansteelant, Marc G., to Sperry Corporation. Knotting mechanism. 4,223,516, Cl. 56-343.000.

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Vaughn, Wilbur C. Guy wire guard. 4,223,491, Cl. 52-147.000.

VEB Mansfeld Kombinat Wilhelm Pieck: *See*—
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Veiga, Manuel J.; and Petersen, Richard E., to Compo Industries, Inc. Imitation-leather material and method of preparing such material. 4,224,375, Cl. 428-315.000.

Ventrice, Raymond, to Swim 'N Play, Inc. Prefabricated swimming-pool construction. 4,223,498, Cl. 52-249.000.

Vermeulen, Jean-Pierre. Shoe sole containing discrete air-chambers. 4,223,455, Cl. 36-29.000.

Vermeulen, Leon L.; and Mertens, Ludovicus M., to AGFA-GEVAERT N.V. Photographic material for use in the silver complex diffusion transfer process. 4,224,402, Cl. 430-517.000.

Veron, Jean: *See*—
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Vickery, Earl C.; Schmoock, James C.; and Brown, Clyde M., Jr., to Raytheon Company. Semiconductor voltage reference device. 4,224,631, Cl. 357-13.000.
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Villadsen, John; Livbjerg, Hans; and Moller, Carl E. Catalyst for dehydrogenating organic compounds, in particular amines, thiols, and alcohols, and a process for its preparation. 4,224,190, Cl. 252-463.000.
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Viza, Dimitri; Adamopoulos, Dimitri; and Phillips, John, to International Institute of Differentiation Limited, The. Production of specific immune nucleic acids cell dialysates and antibodies. 4,224,404, Cl. 435-2.000.
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Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,176, Cl. 252-174.110.
Sprecker, Mark A.; Schmitt, Frederick L.; Vock, Manfred H.; Vinals, Joaquin F.; and Kiwala, Jacob, 4,224,346, Cl. 426-3.000.
Voelker, James E.: *See—*
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Baird, William G., Jr.; and Pike, LeRoy, 4,224,262, Cl. 264-22.000.
Feinberg, Stewart C.; Lundsager, Christian B.; Lundquist, Joseph T., Jr.; and Balouskus, Robert A., 4,224,393, Cl. 429-251.000.
Heinemann, Frederick E., 4,224,370, Cl. 428-246.000.
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Wagner, Alfred; and Ames, Adolf, to Swiss Aluminium Ltd. Extrusion press stem with at least one channel running approximately axially through it. 4,223,546, Cl. 72-253.00A.
Wagner, Alfred; and Ames, Adolf, to Swiss Aluminium Ltd. Process and device for extruding hollow sections. 4,223,548, Cl. 72-265.000.
Wagner Electric Corporation: *See—*
Cruse, Oliver B., 4,223,953, Cl. 303-2.000.
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Wallshein, Melvin. Orthodontic face bow. 4,224,022, Cl. 433-5.000.
Walter, Leo, to Electronics Stamping Corporation. Compliant backplane electrical connector. 4,223,970, Cl. 339-17.00C.
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Walton, Richard J., to PPG Industries, Inc. Cathode assembly for electrolytic aluminum reduction cell. 4,224,128, Cl. 204-243.00R.
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Wang, John L.; Pickus, Milton R.; and Douglas, Kent E., to United States of America, Energy. Method of manufacturing a niobium-aluminum-germanium superconductive material. 4,223,434, Cl. 29-599.000.
Ware, Chester D.: *See—*
Sanborn, Duane F.; and Ware, Chester D., 4,223,537, Cl. 62-174.000.
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Watson, W. Gary; and Breedis, John F., to Olin Corporation. Copper base alloy and process. 4,224,066, Cl. 75-153.000.
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Weber, Kurt, to Rieter Deutschland GmbH. Turntable for depositing a fiber sliver into a spinning can. 4,223,422, Cl. 19-159.00R.
Weber, Otto K., to Sensor Technology, Inc. Optical encoder. 4,224,514, Cl. 250-231.0SE.
Weiertz, Stig H. A.; and Janiszewski, Grzegorz K., to AB Volvo. Overdrive for motor vehicles. 4,223,572, Cl. 74-781.00R.
Weigel, Horst; and Muller, Karl, to Klockner-Humboldt-Wedag AG. Apparatus for direct recovery of metal from metal-bearing ores. 4,223,876, Cl. 266-156.000.
Weinreich, Stephen D.; and Berman, Joel, to Berman, Joel. Window shade roller assembly. 4,223,714, Cl. 160-309.000.
Welch, Willard M., Jr., to Pfizer Inc. 2-Substituted-trans-5-aryl-2,3,4,4a,5,9b-hexahydro-1H-pyrido[4,3-b]indoles. 4,224,329, Cl. 424-256.000.
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Weld, Richard G., 4,223,952, Cl. 301-63.0DS.
Welker, Robert H. Disc chart paper with reinforced separating edge. 4,224,629, Cl. 346-137.000.
Wells, Ralph W. Applicator for applying a coating of stippled plaster. 4,223,999, Cl. 401-176.000.
Wells, Roy E., to Kartridg Pak Co., The. Double-knife cut-off for chub machine. 4,223,508, Cl. 53-138.00R.
Welty, Gary A. Potted plant transplant liner. 4,223,480, Cl. 47-73.000.
Welzel, Gerhard: *See—*
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Wessel, Wolf; Sautter, Wilfried; Engel, Gerhard; and Stumpp, Gerhard, to Robert Bosch GmbH. Method and apparatus for controlling the operation of a diesel engine. 4,223,654, Cl. 123-358.000.
West Electric Co., Ltd.: *See—*
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Cruickshank, David G.; and Muniz, Jose M., 4,224,500, Cl. 219-121.0LE.
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Bange, Joseph B., 4,223,829, Cl. 233-24.000.
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Krueger, William H., 4,223,575, Cl. 81-57.380.
Lugosi, Robert; Lessmann, Gerald G.; Male, Alan T.; and LaFave, Richard A., 4,224,267, Cl. 264-111.000.
Phillips, David C.; and Garbuny, Max, 4,224,525, Cl. 250-531.000.
Smith, James D. B.; and Kauffman, Robert N., 4,224,541, Cl. 310-45.000.
Veronesi, Luciano; and Francis, Woodie R., 4,224,363, Cl. 417-360.000.
Westvaco Corporation: *See—*
Gilbert, Earl F., 4,223,827, Cl. 229-15.000.
Weyerhaeuser Company: *See—*
Alvensleben, Eric; Ryan, Jay R.; and Gaughran, Wayne C., 4,223,633, Cl. 118-203.000.
Wheaton, Gregory A.; Kao, Jar-lin; and Sheng, Ming N., to Atlantic Richfield Company. Preparation of alkylene carbonates from olefins. 4,224,223, Cl. 260-340.200.
Whitcomb, Duane A.: *See—*
Dawson, John T.; and Whitcomb, Duane A., 4,223,611, Cl. 104-247.000.
White, Alfred K.: *See—*
Brearley, Malcolm; and White, Alfred K., 4,223,957, Cl. 303-106.000.
White Consolidated Industries, Inc.: *See—*
Braden, Ralph S.; and Kronenberger, Paul E., 4,223,538, Cl. 62-443.000.
White, Herbert O. Timing mechanism for wind motors. 4,224,012, Cl. 416-117.000.
White, Robert W.: *See—*
Cooperman, Murray C.; Duneczky, Francis; Naughton, Francis C.; and White, Robert W., 4,224,312, Cl. 424-70.000.
Whitehead Motofides SpA: *See—*
Garigioli, Alberto, 4,224,042, Cl. 55-237.000.
Whitesides, Michael: *See—*
Hoefer, Peter S.; and Whitesides, Michael, 4,224,134, Cl. 204-299.00R.
Whitfield, Thomas M.: *See—*
Hunt, Leslie; Nicolson, Ian T.; and Whitfield, Thomas M., 4,224,266, Cl. 264-75.000.
Whitley, John A.; and Rowe, Lacy A. Mailbox with improved door opening means and flag operator. 4,223,828, Cl. 232-45.000.
Whitted, Robert L.; and Simmons, James E., to Poinsett Machine Works, Inc. Method and apparatus for bulking yarn. 4,223,520, Cl. 57-350.000.
Wickett, Richard S. Axel retracter. 4,223,574, Cl. 81-3.00R.
Wicks, Richard W.: *See—*
Gomez, Magdalena U.; and Wicks, Richard W., 4,224,406, Cl. 435-7.000.
Widdershoven, Louis H., to Raypak Produkten B.V. Gas boiler control. 4,223,641, Cl. 122-448.00R.
Wiedemann, Wolfgang, to Hoechst Aktiengesellschaft. Electrophotographic recording material with cellulose acyl ester binder. 4,224,395, Cl. 430-59.000.
Wiedholz, Rudolf: *See—*
Rostock, Kai; Birke, Johann; Wiedholz, Rudolf; Bauer, Johann; and Balwe, Thomas, 4,224,437, Cl. 528-500.000.
Wieske, Reinhold: *See—*
Dahl, Helmut; Schottle, Ernst; Wieske, Reinhold; Weber, Alfred; and Kennecke, Mario, 4,224,320, Cl. 424-243.000.
Wigent, Donald J.: *See—*
Cornett, Johnny A.; Gentry, Howard S.; Seay, Wilfred M.; Tucker, Terry A.; and Wigent, Donald J., 4,224,621, Cl. 343-5.0EM.
Wilbourne, Calvin L.: *See—*
Lunde, Frithjof M.; and Wilbourne, Calvin L., 4,223,662, Cl. 126-424.000.
Wilder, Paul R.; and Wood, Chester W., to Dover Corporation. Fluid dispensing nozzle. 4,223,699, Cl. 137-801.000.
Wilfert, Thomas: *See—*
Glockler, Otto; Herth, Harro; Wilfert, Thomas; and Kraus, Bernd, 4,223,643, Cl. 123-492.000.
Wilkomirsky, Igor A. E.; Boorman, Roy S.; and Salter, Robert S., to New Brunswick Research and Productivity Council. Recovery of non-ferrous metals by thermal treatment of solutions containing non-ferrous and iron sulphates. 4,224,122, Cl. 204-119.000.
Will, Peter, to Adams-Russell Co., Inc. Broadband doubly balanced mixer having improved termination insensitivity characteristics. 4,224,572, Cl. 455-326.000.
William H. Rorer, Inc.: *See—*
Campbell, Henry F.; Santora, Norman F.; and Douglas, George H., 4,224,340, Cl. 424-304.000.
Williams, Dale: *See—*
Smith, Randlow; MacLean, John P.; Williams, Dale; Barkley, Rich W.; and Jones, Henry B., 4,223,843, Cl. 239-558.000.
Williams, Gerald D., to Marmon Group, Inc., The. Method of forming a vehicle axle assembly. 4,223,825, Cl. 228-114.000.
Williams, John E.; and Rabe, Lester H., to Spray Safe Company, Inc. Refillable dispensing device having wiper seal. 4,223,808, Cl. 222-88.000.
Williams, Ronald A., to Baxter Travenol Laboratories, Inc. Solution containers such as blood bags and system for preparing same. 4,223,675, Cl. 128-272.000.
Willke, Herbert L., Jr.: *See—*
Gorchev, Dimiter; Rodgers, Thomas P.; and Willke, Herbert L., Jr., 4,223,832, Cl. 236-49.000.

Willyoung, David M., to General Electric Company. Combined cycle power plant with pressurized fluidized bed combustor. 4,223,529, Cl. 60-39.18A.
Wilson, Archie A.: *See—*
Clark, Howard K.; and Wilson, Archie A., 4,223,500, Cl. 52-309.400.
Wilson, Charles A., II: *See—*
Quinn, Clayton B.; and Wilson, Charles A., II, 4,224,434, Cl. 528-199.000.
Wilson, Eugene M.: *See—*
Black, William J.; Richardson, Warner G.; and Wilson, Eugene M., 4,223,460, Cl. 37-8.000.
Wilson, James W. A.; and Steigerwald, Robert L., to General Electric Company. Efficient base drive circuit for high current transistors. 4,224,535, Cl. 307-270.000.
Wilson, Paul A.: *See—*
Dumbaugh, George D.; and Wilson, Paul A., 4,224,006, Cl. 414-375.000.
Wilson, William G.; and Kay, D. Alan R., to Molycorp, Inc. Methods of desulphurizing fluid materials. 4,224,058, Cl. 75-58.000.
Winans, Stephen C.: *See—*
Beisner, Robert W.; and Winans, Stephen C., 4,224,235, Cl. 260-449.00L.
Winrow, Donald, to Ferranti-Packard Limited. Display or indicator element. 4,223,464, Cl. 40-449.000.
Winston, John H., to Outboard Marine Corporation. Connecting rod cap alignment fixture. 4,223,937, Cl. 294-103.00R.
Winter, Berthold, to G.D. Societa per Azioni. Device for introducing small objects in the packaging of articles. 4,223,802, Cl. 221-268.000.
Winters, Albert C., to Manhattan Store Interiors, Inc. Glass display case. 4,223,966, Cl. 312-140.000.
Wintershall Aktiengesellschaft: *See—*
Schulz, Walther; and Gebetsberger, Wilhelm, 4,223,730, Cl. 166-272.000.
Wirick, Francis D.: *See—*
Arndt, John J.; Roadarmel, Gary W.; and Wirick, Francis D., 4,224,001, Cl. 403-163.000.
Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Schnoes, Heinrich K.; Napoli, Joseph L., Jr.; and Onisko, Bruce L., 4,224,230, Cl. 260-397.200.
DeLuca, Hector F.; Schnoes, Heinrich K.; Tanaka, Yoko; and Alper, Joseph B., 4,224,231, Cl. 260-397.200.
Hilal, Mohamed A., 4,223,723, Cl. 165-133.000.
Witt, Michael; and Brawer, Seymour. Traction pad. 4,223,835, Cl. 238-14.000.
Wittwer, Arnold: *See—*
Mueller, Herbert; Toussaint, Herbert; and Wittwer, Arnold, 4,224,251, Cl. 260-584.00R.
Wixon, Harold E., to Colgate-Palmolive Company. Novel fabric conditioning compounds. 4,224,250, Cl. 260-584.00R.
Woitschatzke, Hans: *See—*
Danner, William D.; and Woitschatzke, Hans, 4,223,909, Cl. 280-604.000.
Wolfe, Ingo E.; and Kuban, W. G., to Kurt Manufacturing Co., Inc. Machine tool vise. 4,223,879, Cl. 269-32.000.
Woltersdorf, Otto W., Jr.; and deSolms, Susan J., to Merck & Co., Inc. Novel pyrazinecarboxamides and processes for preparing same. 4,224,447, Cl. 544-405.000.
Woo, Sam L.: *See—*
Henrick, Clive A.; Labovitz, Jeffrey N.; Leippe, Michael M.; and Woo, Sam L., 4,224,330, Cl. 424-263.000.
Wood, Chester W.: *See—*
Wilder, Paul R.; and Wood, Chester W., 4,223,699, Cl. 137-801.000.
Wood, Joseph L.: *See—*
Gill, Jaswant S.; Wood, Joseph L.; and Rachima, Nissim, 4,223,949, Cl. 299-5.000.
Wood, Rex C.: *See—*
Ayers, Joseph W.; and Wood, Rex C., 4,223,751, Cl. 177-210.00C.
Woodburn, William: *See—*
Kent, Anthony J.; and Woodburn, William, 4,224,146, Cl. 209-243.000.
Woodruff, Richard E., to TransFRESH Corporation. Process and package for extending the life of cut vegetables. 4,224,347, Cl. 426-106.000.
Workman, William, Jr., to Cooper Industries, Inc. Torque responsive motor shutoff mechanism for fluid operated tool. 4,223,745, Cl. 173-12.000.
Wright, James G., Jr.: *See—*
Lynch, Brian; and Wright, James G., Jr., 4,224,105, Cl. 162-268.000.
Wright, Patrick P. Suitcase with a back pack adaptor. 4,223,819, Cl. 224-211.000.
Wristers, Harry J., to Exxon Research & Engineering Co. Shaping and sizing of catalysts. 4,224,185, Cl. 252-429.00B.
Wuchinich, David G.; Broadwin, Alan; and Andersen, Robert P., to Cavitron Corporation. Ultrasonic aspirator. 4,223,676, Cl. 128-276.000.
Wunder, Friedrich; Arpe, Hans-Jurgen; Leupold, Ernst I.; and Schmidt, Hans-Joachim, to Hoechst Aktiengesellschaft. Process for the manufacture of oxygen-containing carbon compounds from synthesis gas. 4,224,236, Cl. 260-449.00R.
Wurst, William C.: *See—*
Mercer, William R.; Wurst, William C.; and Brodeur, Lester R., 4,224,623, Cl. 343-103.000.
Wurtman, Richard J., to Massachusetts Institute of Technology. Process and composition for decreasing blood serum prolactin levels. 4,224,343, Cl. 424-319.000.
Wyman, Floyd H., to Marshall and Williams Company. Drum filter and method. 4,224,166, Cl. 210-396.000.
Xerox Corporation: *See—*
Crean, Peter A., 4,224,523, Cl. 250-396.00R.
Marlett, Calvin J.; Reed, Edwin A.; Johnson, Richard C.; and Hug, William F., 4,224,579, Cl. 331-94.50G.
Poliet, Jean-Claude, 4,224,396, Cl. 430-107.000.
Yamada, Kenji: *See—*
Nomura, Yasushi; Nakajima, Fumio; Yamada, Kenji; and Machida, Takayasu, 4,223,522, Cl. 368-66.000.
Yamada, Syozo: *See—*
Honna, Takaji; Tanaka, Motoaki; Yamada, Syozo; and Miyake, Hidekazu, 4,224,450, Cl. 548-248.000.
Yamada, Takashi: *See—*
Ebihara, Heihachiro; Sekiya, Fukuo; and Yamada, Takashi, 4,224,531, Cl. 307-221.00C.
Yamaga, Eiichi: *See—*
Nakada, Akira; Aoki, Eiichiro; Oya, Akiyoshi; Okumura, Takatoshi; Uchiyama, Yasuji; and Yamaga, Eiichi, 4,223,584, Cl. 84-1.170.
Yamaguchi, Hideo; Kobayashi, Masahiro; Mizote, Atsunobu; and Iwamuro, Yoshiyuki, to Otsuka Chemical Co. Ltd.; and Sansho Co., Ltd. Bonding composition for incombustible fibrous materials. 4,224,103, Cl. 162-135.000.
Yamaguchi, Hirohisa: *See—*
Mawatari, Akinori; Yamaguchi, Hirohisa; Nakamura, Kenji; and Uchiumi, Satoshi, 4,224,642, Cl. 360-32.000.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Transverse automatic power transmission with improved bearing construction for output gear elements. 4,223,566, Cl. 74-606.00R.
Yamamori, Takahiro; Iwanaga, Kazuyoshi; and Ohtsuka, Kunio, to Nissan Motor Company, Limited. Power transmission for automotive vehicle. 4,223,570, Cl. 74-695.000.
Yamamoto, Hisao: *See—*
Sunagawa, Makoto; Sato, Hiromi; Katsube, Junki; and Yamamoto, Hisao, 4,224,344, Cl. 424-330.000.
Yamasa Shoyu Kabushiki Kaisha: *See—*
Kusakabe, Hitoshi; Kuninaka, Akira; and Soda, Kenji, 4,224,407, Cl. 435-25.000.
Yamashita, Sadahiko: *See—*
Makimoto, Mitsuo; and Yamashita, Sadahiko, 4,224,587, Cl. 333-205.000.
Yamashita, Yohachi: *See—*
Okuma, Hideo; Takahashi, Takashi; Yamashita, Yohachi; and Furukawa, Osamu, 4,224,174, Cl. 252-62.900.
Yamazaki, Etuo, to Fujitsu Fanuc Limited. Tracer control system. 4,224,670, Cl. 364-474.000.
Yanagishima, Takayuki; and Matsumura, Akira, to Nissan Motor Company, Limited. Driving assurance system for wheeled vehicles. 4,224,609, Cl. 340-576.000.
Yankell, Samuel L.: *See—*
Thiele, Geraldine H.; and Yankell, Samuel L., 4,224,307, Cl. 424-49.000.
Yao, Yoshiaki: *See—*
Aoyagi, Masaya; Hayashi, Mikio; Yoshida, Yasuyuki; and Yao, Yoshiaki, 4,223,412, Cl. 3-1.900.
Yascheritsyn, Petr I.: *See—*
Sidorenko, Valery A.; Morgunsky, Evgeny I.; Plotnikov, Vladimir A.; Vishnev, Nikolai V.; and Yascheritsyn, Petr I., 4,223,580, Cl. 82-36.00R.
Yasumatsu, Jun: *See—*
Tanaka, Hideki; Kubota, Tatsushi; Yasumatsu, Jun; and Tsujiuchi, Yoshio, 4,223,915, Cl. 280-804.000.
Yen, Shiao-Ping S.: *See—*
Rembaum, Alan; Yen, Shiao-Ping S.; and Dreyer, William J., 4,224,198, Cl. 260-8.000.
Yokoo, Shuji: *See—*
Hayashi, Kenji; Washizawa, Mitsuo; and Yokoo, Shuji, 4,224,348, Cl. 426-234.000.
Yonezawa, Hiroichi, to Kabushiki Kaisha Yoneya Gangu. Savings box toy with locking lid for safety. 4,223,470, Cl. 46-5.000.
Yonezawa, Toshio; Ajima, Takashi; and Uchida, Masato, to Tokyo Shibaura Electric Co., Ltd. Semiconductor device with thermally compensating SiO_2-silicate glass-SiC passivation layer. 4,224,636, Cl. 357-54.000.
Yoo, Jin S.: *See—*
Masologites, George P.; Burk, Emmett H., Jr.; Yoo, Jin S.; and Karch, John A., 4,224,038, Cl. 44-1.0SR.
Yoshida, Hajime, to Hajime Industries, Ltd. Container inspection system. 4,223,790, Cl. 209-590.000.
Yoshida Kogyo K.K.: *See—*
Akashi, Shunji, 4,223,425, Cl. 24-205.11R.
Yoshida, Mitsutaka: *See—*
Nishio, Kanemitsu; Takagi, Shunichi; and Yoshida, Mitsutaka, 4,224,554, Cl. 315-53.000.
Yoshida, Yasuyuki: *See—*
Aoyagi, Masaya; Hayashi, Mikio; Yoshida, Yasuyuki; and Yao, Yoshiaki, 4,223,412, Cl. 3-1.900.
Yoshikai, Tatsuki: *See—*
Higute, Michinosuke; and Yoshikai, Tatsuki, 4,223,628, Cl. 114-246.000.
Yoshinaga, Fumihiro: *See—*
Nakamori, Shigeru; Morioka, Hajimu; and Yoshinaga, Fumihiro, 4,224,409, Cl. 435-107.000.

Yoshino Kogyosho Co., Ltd.: *See*—
Uekusa, Hiroshi, 4,224,560, Cl. 318-603.000.
Yoshisato, Akiyuki; and Tobita, Katsumi, to Alps Electric Co., Ltd. Quartz crystal oscillator. 4,224,580, Cl. 331-116.00R.
Yoshizawa, Keiichi, to TDK Electronics Co., Ltd. Sectional rack. 4,223,613, Cl. 108-64.000.
Youdelis, William V. Chloride salt-silicon containing slag compositions for cast iron melts. 4,224,070, Cl. 75-257.000.
Young, Andrew J.: *See*—
Pardikes, Dennis G.; Flowers, William F.; Huff, Al S.; and Young, Andrew J., 4,224,156, Cl. 210-123.000.
Young, Vernon V., to International Minerals and Chemical Corporation. Nitro-olefin-substituted quinoxaline dioxides. 4,224,324, Cl. 424-250.000.
Yu, Ruey J.: *See*—
Van Scott, Eugene J.; and Yu, Ruey J., 4,224,339, Cl. 424-289.000.
Yukimoto, Kazuyoshi; Ogasawara, Shinzi; Sakamoto, Mitsuhiro; and Kawamura, Yasunori, to Aisin Seiki Company, Limited. Hinge structure for automobile hoods. 4,223,420, Cl. 16-128.100.
Yurik, Peter P. Locking tong for handling fuel. 4,223,933, Cl. 294-11.000.
Zangiacomi, Fernand; and Gautheret, Robert, to France Ebauches. Optical fiber junction device notably for telecommunications. 4,223,976, Cl. 350-96.210.
Zappala, Mary C. Hairdressing protective visor. 4,223,407, Cl. 2-174.000.
Zarount, Alfred, to Bell Telephone Laboratories, Incorporated. Method and apparatus for apportioning call charges. 4,224,472, Cl. 179-7.10R.
Zeller, Paul: *See*—
Hromatka, Otto; Binder, Dieter; Pfister, Rudolf; and Zeller, Paul, 4,224,445, Cl. 544-212.000.
Zemel Brothers, Inc.: *See*—
Eager, Donald W., 4,223,836, Cl. 239-2.00S.
Zichis, Joseph, deceased; and Zichis, Lillian K., executrix. Preparation of Forssman antibody neutralizing antigen and product thereof. 4,224,305, Cl. 424-12.000.
Zichis, Joseph, deceased; and by Zichis, Lillian K., executrix. Preparation of an infectious mononucleosis antibody neutralizing antigen and product thereof. 4,224,306, Cl. 424-12.000.
Zichis, Lillian K., executrix: *See*—
Zichis, Joseph, deceased; and Zichis, Lillian K., executrix, 4,224,305, Cl. 424-12.000.
Zichis, Joseph, deceased; and Zichis, Lillian K., executrix, 4,224,306, Cl. 424-12.000.
Ziecker, Roger A., to Mead Corporation, The. Film tucking packaging machine. 4,223,509, Cl. 53-209.000.
Ziegenbalg, Siegfried; Fischer, Gerhard; Haake, Gerhard; and Siebert, Rudolf, to VEB Mansfeld Kombinat Wilhelm Pieck. Process for the preparation of pure aluminum oxide. 4,224,287, Cl. 423-112.000.
Zielfleisch, Jorg, to Industriewerk Schaeffler OHG. Play-free rolling bearings for low loads and low rpms. 4,223,962, Cl. 308-184.00R.
Ziemer, John H.: *See*—
Olszewski, Walter J.; and Ziemer, John H., 4,224,045, Cl. 62-30.000.
Zies, Ray K.: *See*—
Perkinson, William B.; and Zies, Ray K., 4,224,477, Cl. 179-18.0ET.
Ziman, Stephen D.: *See*—
Reynolds, Richard N., Jr.; Ziman, Stephen D.; and Chan, David C. K., 4,224,453, Cl. 549-63.000.
Zimmer, Max: *See*—
Mathis, Paul; and Zimmer, Max, 4,223,996, Cl. 366-27.000.
Zimmerman, Arnold: *See*—
Fricker, Paul; Vogler, Gottfried; Knecht, Hans-Rudolf; Pierobon, Giampaolo; Schumacher, Bernd; and Zimmerman, Arnold, 4,224,495, Cl. 219-69.00V.
Zimmerman, John A., Jr.; and Leitzel, Larry L., to AMP Incorporated. Shunt protected power connector. 4,224,486, Cl. 200-51.100.
Zimmermann, Ulrich; Pilwat, Gunter; Bock, Karin; and Buers, Hermann-Josef, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Physiological preparation containing loaded cells in suspension and an agent for counteraction of cell membrane disintegration. 4,224,313, Cl. 424-94.000.
Zinser Textilmaschinen GmbH, Firma: *See*—
Konig, Gunter; Mutschler, Gunter; Scheutle, Erich; and Bucher, Erich, 4,223,519, Cl. 57-291.000.
Zissimopoulos, Nick: *See*—
Garrett, Scott T.; Jess, Thurman S.; Knigge, Vincent L.; Kulle, Lee K.; Rudzena, William L.; and Zissimopoulos, Nick, 4,223,813, Cl. 222-447.000.
Zoecon Corporation: *See*—
Henrick, Clive A.; Labovitz, Jeffrey N.; Leippe, Michael M.; and Woo, Sam L., 4,224,330, Cl. 424-263.000.
Zoller, Heinrich: *See*—
Jaquet, Jean-Claude; Heckler, Manfred; and Zoller, Heinrich, 4,224,065, Cl. 75-139.000.
zu Kocker, Heinz M.; and Tietze, Jurgen, to Bergwerksverband GmbH. Process for the solvent extraction of solid carbon-containing materials, principally coal. 4,224,136, Cl. 208-8.0LE.
Zweig, Gilbert, to Trans World Technology Laboratories Inc. (TWT Labs, Inc.). Continuous tone diazo material. 4,224,397, Cl. 430-157.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 23RD DAY OF SEPTEMBER, 1980

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Lightfoot, Daniel J. Solar heat collector module. Re. 30,407, Cl. 126-438.000.

LIST OF DESIGN PATENTEES

AAA Associates Inc.: *See*—
Mann, Wilford R., 257,060, Cl. D23-163.000.

Abernethy, D. S., to Merritt Foods Co. Frozen confection. 256,960, 9-23-80, Cl. D1-18.000.

Adams, Edward H.; and Olson, Gene E., to Snap-On Tools Corporation. Impact wrench. 256,980, 9-23-80, Cl. D8-68.000.

Alcar Industries: *See*—
Haagedoorn, Anton; Spinozza, Leonard; and Merlin, Philip, 256,999, Cl. D9-224.000.

Aqua-Leisure Industries, Inc.: *See*—
Fireman, Simon C., 256,961, Cl. D2-234.000.
Fireman, Simon C., 256,962, Cl. D2-234.000.

Associated American Industries, Inc.: *See*—
Petrie, Ross J., 257,039, Cl. D14-84.000.

Barr, Josef F. Bracelet or similar article. 257,015, 9-23-80, Cl. D11-4.000.

Barr, Josef J. Necklace. 257,016, 9-23-80, Cl. D11-16.000.

Barr, Josef J. Bracelet or similar article. 257,017, 9-23-80, Cl. D11-16.000.

Barr, Josef J. Spinning finger ring. 257,018, 9-23-80, Cl. D11-27.000.

Barr, Josef J. Finger ring or similar article. 257,019, 9-23-80, Cl. D11-29.000.

Barr, Josef J. Finger ring. 257,020, 9-23-80, Cl. D11-29.000.

Barr, Josef J. Finger ring. 257,021, 9-23-80, Cl. D11-34.000.

Barr, Josef J. Finger ring or similar article. 257,022, 9-23-80, Cl. D11-35.000.

Barr, Josef J. Earring or similar article. 257,023, 9-23-80, Cl. D11-43.000.

Barr, Josef J. Dangle earring. 257,024, 9-23-80, Cl. D11-43.000.

Barr, Josef J. Pendant. 257,025, 9-23-80, Cl. D11-75.000.

Barr, Josef J. Earring. 257,026, 9-23-80, Cl. D11-75.000.

Bausch & Lomb Incorporated: *See*—
Speaker, Edwin A., 257,044, Cl. D16-54.000.

Brhel, Alvin A.: *See*—
Williams, Larry J.; and Brhel, Alvin A., 257,000, Cl. D9-242.000.

Burroughs Corporation: *See*—
Paterson, Robert W., 257,040, Cl. D14-94.000.

Cassina, Franco, to Cassina S.p.A. Chair. 256,969, 9-23-80, Cl. D6-66.000.

Cassina, Franco, to Cassina S.p.A. Chair. 256,970, 9-23-80, Cl. D6-66.000.

Cassina, Franco, to Cassina S.p.A. Arm-chair. 256,971, 9-23-80, Cl. D6-71.000.

Cassina, Franco, to Cassina S.p.A. Arm-chair. 256,972, 9-23-80, Cl. D6-73.000.

Cassina S.p.A.: *See*—
Cassina, Franco, 256,969, Cl. D6-66.000.
Cassina, Franco, 256,970, Cl. D6-66.000.
Cassina, Franco, 256,971, Cl. D6-71.000.
Cassina, Franco, 256,972, Cl. D6-73.000.

Chambers, Jack R. Skateboard truck. 257,051, 9-23-80, Cl. D21-227.000.

Cicero, Edward L. Golfclub. 257,050, 9-23-80, Cl. D21-214.000.

Clairol Incorporated: *See*—
MacGregor, Fran, 256,994, Cl. D9-185.000.

Creamer, Joan K.; and DeLuca, Donald, to General Electric Company. Wall plate-burlap in frame. 256,985, 9-23-80, Cl. D8-353.000.

Cressman, Robert C.; and Stefani, Joseph P., to General Electric Company. Circuit tester. 257,014, 9-23-80, Cl. D10-78.000.

Cummings, Daniel L. Platform support. 256,975, 9-23-80, Cl. D6-113.000.

DeLuca, Donald: *See*—
Creamer, Joan K.; and DeLuca, Donald, 256,985, Cl. D8-353.000.

Dexter, Carl J. Bathtub safety handle. 256,973, 9-23-80, Cl. D6-86.000.

Dogliotti, Amilcare, to P. Ferrero & C. S.p.A. Beverage heating apparatus. 256,978, 9-23-80, Cl. D7-123.000.

Enco Die Casting Co.: *See*—
Nadle, Edward A., 256,979, Cl. D8-10.000.

Ezell, James D. Outdoor play device or the like. 257,053, 9-23-80, Cl. D21-243.000.

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11 4,224,056
35 4,224,057
58 4,224,058
68 A 4,224,059
124 4,224,060
125 4,224,061
128 E 4,224,062
129 4,224,063
130 R 4,224,064
139 4,224,065
153 4,224,066
170 4,224,067
206 4,224,068
255 4,224,069
257 4,224,070

CLASS 81

3 R 4,223,574
57.38 4,223,575

CLASS 82

1 C 4,223,576
4,223,577
4,223,578
3 4,223,579
36 R 4,223,580

CLASS 83

167 4,223,581

CLASS 84

1.01 4,223,582
4,223,583
1.17 4,223,584

CLASS 85

42 4,223,585
63 4,223,586
68 4,223,587

CLASS 86

45 4,223,588

CLASS 89

33 SF 4,223,589
35 R 4,223,590
37.5 L 4,223,591

CLASS 91

189 A 4,223,592
477 4,223,593
504 4,223,594

CLASS 92

72 4,223,595

CLASS 93

62 4,223,596
77 FT 4,223,597

CLASS 98

2.11 4,223,598
115 SB 4,223,599

CLASS 100

37 4,223,600
117 4,223,601

CLASS 101

128.21 4,223,602
138 4,223,603
415.1 4,223,604

CLASS 102

27 R 4,223,605
49.3 4,223,606
213 4,223,607
244 4,223,608

CLASS 104

20 4,223,609
172 S 4,223,610
247 4,223,611

CLASS 105

1 R 4,223,612

CLASS 106

22 4,224,071
35 4,224,072
44 4,224,073
48 4,224,074
55 4,224,075
90 4,224,076
100 4,224,077
110 4,224,078
274 4,224,079
308 Q 4,224,080

CLASS 108

64 4,223,613

CLASS 110

238 4,223,614
264 4,223,615

CLASS 112

158 E 4,223,616
184 4,223,617
186 4,223,618

CLASS 113

120 G 4,223,619

CLASS 114

61 4,223,620
4,223,621
74 R 4,223,622
77 R 4,223,623
144 E 4,223,624
147 4,223,625
221 A 4,223,626
242 4,223,627
246 4,223,628
263 4,223,629

CLASS 116

265 4,223,631

CLASS 118

58 4,223,632
203 4,223,633
401 4,223,634

CLASS 119

14.02 4,223,635
29 4,223,636
52 B 4,223,638
52 R 4,223,637
98 4,223,639

CLASS 122

1 R 4,223,640
448 R 4,223,641

CLASS 123

1 A 4,223,642
41.11 4,223,646
59 A 4,223,647
90.16 4,223,648
179 K 4,223,657
292 4,223,645
319 4,223,649
358 4,223,654
366 4,223,653
438 4,223,651
440 4,223,652
463 4,223,655
489 4,223,644
492 4,223,643
568 4,223,650
598 4,223,656

CLASS 124

19 4,223,658

CLASS 126

66 4,223,659
190 4,223,660
204 4,223,661
424 4,223,662
426 4,223,663
429 4,223,666
438 Re.30,407
4,223,664
449 4,223,665
450 4,223,667

CLASS 128

66 4,223,668
132 D 4,223,669
134 4,223,670
200.26 4,223,671
214 R 4,223,672
215 4,223,673
217 4,223,674
272 4,223,675
276 4,223,676
287 4,223,677
419 D 4,223,678
419 PT 4,223,679
633 4,223,680
672 4,223,681
4,223,682
706 4,223,683

CLASS 131

105 4,223,684
109 R 4,223,685
173 4,223,686
180 4,223,687

CLASS 134

60 4,223,688

CLASS 135

1 A 4,223,689
5 B 4,223,690

CLASS 136

233 4,224,461
248 4,224,082
251 4,224,081

CLASS 137

13 4,223,691
78.4 4,223,692
106 4,223,693
118 4,223,694
173 4,223,695
206 4,223,696
527.8 4,223,697
595 4,223,698
801 4,223,699
874 4,223,700
882 4,223,701

CLASS 138

106 4,223,702

CLASS 139

145 4,223,703

CLASS 140

93.4 4,223,704
104 4,223,705

CLASS 141

59 4,223,706

CLASS 144

193 R 4,223,707
326 R 4,223,708

CLASS 148

1.5 4,224,083
4,224,084
11.5 P 4,224,085
26 4,224,086
133 4,224,087
187 4,224,088
4,224,089

CLASS 150

0.5 4,223,710
1 4,223,709

CLASS 151

37 4,223,711

CLASS 152

209 D 4,223,712
330 RF 4,223,713

CLASS 156

48 4,224,090
73.3 4,224,091
82 4,224,092
99 4,224,093
169 4,224,094
215 4,224,095
307.3 4,224,097
380 4,224,096
512 4,224,098
605 4,224,099
617 M 4,224,100
643 4,224,101

CLASS 160

309 4,223,714

CLASS 162

5 4,224,102
135 4,224,103
205 4,224,104
268 4,224,105

CLASS 164

1 4,223,715
26 4,223,716

76 4,223,717
149 4,223,718
448 4,223,719

CLASS 165

14 4,223,720
104 S 4,223,721
111 4,223,722
133 4,223,723

CLASS 166

68 4,223,724
250 4,223,725
4,223,727
251 4,223,726
266 4,223,728
271 4,223,729
272 4,223,730
4,223,731
291 4,223,732
293 4,223,733
299 4,223,734
303 4,223,735
315 4,223,736
362 4,223,737
368 4,223,738

CLASS 169

52 4,223,739
70 4,223,740

CLASS 172

240 4,223,741
456 4,223,742
583 4,223,743

CLASS 173

12 4,223,745
48 4,223,744

CLASS 174

37 4,224,462
47 4,224,463
65 R 4,224,464
135 4,224,465

CLASS 175

40 4,223,746
65 4,223,747
66 4,223,748
227 4,223,749

CLASS 176

75 4,224,106
78 4,224,107

CLASS 177

41 4,223,750
210 C 4,223,751
211 4,223,752

CLASS 178

69 G 4,224,466

CLASS 179

1 E 4,224,467
4,224,469
1 GD 4,224,471
1 N 4,224,468
1 VL 4,224,470
7.1 R 4,224,472
17 E 4,224,476
18 DA 4,224,479
18 ET 4,224,477
18 FA 4,224,478
100.3 B 4,224,481
100.3 G 4,224,480
157 4,224,482
175.2 R 4,224,483

CLASS 180

6.2 4,223,753
90 4,223,754
123 4,223,755
169 4,223,756
273 4,223,757
291 4,223,758

CLASS 181

116 4,223,759
147 4,223,760

CLASS 182

5 4,223,761

CLASS 188

1 B 4,223,762
1 C 4,223,763
72.7 4,223,764
79.5 P 4,223,765
112 A 4,223,767
112 R 4,223,766

CLASS 192

0.07 4,223,770
0.094 4,223,775
4 A 4,223,768
4,223,769
10 4,223,771
48.6 4,223,772
48.91 4,223,773
85 AA 4,223,774
106.2 4,223,776

CLASS 196

122 4,224,108

CLASS 198

365 4,223,777
389 4,223,778
426 4,223,779
781 4,223,780
793 4,223,781

CLASS 200

38 FB 4,224,484
51.1 4,224,485
4,224,486
61.08 4,224,487
67 A 4,224,488
76 4,224,489
148 R 4,224,490
150 R 4,224,491
153 L 4,224,492
292 4,224,493

CLASS 201

41 4,224,109

CLASS 202

169 4,224,110
255 4,224,111

CLASS 203

18 4,224,112

CLASS 204

1 T 4,224,113
4,224,114
15 4,224,115
4,224,116
4,224,117
4,224,118
64 R 4,224,119
70 4,224,120
98 4,224,121
119 4,224,122
129.55 4,224,123
186 4,224,124
195 B 4,224,125
197 4,224,126
243 M 4,224,127
243 R 4,224,128
263 4,224,129
266 4,224,130
274 4,224,131
279 4,224,132
290 R 4,224,133
299 R 4,224,134
302 4,224,135

CLASS 206

5.1 4,223,782
45.14 4,223,783
88 4,223,784
314 4,223,785
330 4,223,786
387 4,223,787
468 4,223,788
605 4,223,789

CLASS 208

8 LE 4,224,136
10 4,224,137
11 LE 4,224,138
18 4,224,139
124 4,224,140
134 4,224,141
179 4,224,142
216 PP 4,224,144

CLASS 209

211 4,224,143
4,224,145
243 4,224,146
590 4,223,790

CLASS 210

85 4,224,154
117 4,224,155
123 4,224,156
208 4,224,157
220 4,224,158
232 4,224,159
4,224,161
236 4,224,160
242 R 4,224,162
321 B 4,224,163
4,224,164
363 4,224,165
396 4,224,166
460 4,224,167
470 4,224,168
660 4,224,147
696 4,224,151
705 4,224,149
714 4,224,148
729 4,224,152
735 4,224,150
780 4,224,153

CLASS 211

120 4,223,791
162 4,223,792

CLASS 215

220 4,223,793
4,223,794
222 4,223,795

CLASS 219

9.5 4,224,494
69 V 4,224,495
110 4,224,496
121 L 4,224,498
121 LE 4,224,500
121 LM 4,224,497
4,224,499
124.34 4,224,501
137.2 4,224,502
308 4,224,503
388 4,224,504
544 4,224,505

CLASS 220

3.8 4,223,796
5 A 4,223,797
66 4,223,798
230 4,223,799
352 4,223,800

CLASS 221

3 4,223,801
268 4,223,802

CLASS 222

3 4,223,803
4,223,804
5 4,223,805
23 4,223,806
28 4,223,807
88 4,223,808
96 4,223,809
107 4,223,810
136 4,223,811
180 4,223,812
447 4,223,813
565 4,223,814

CLASS 223

2 4,223,815
37 4,223,816
94 4,223,817

CLASS 224

45 E 4,223,818
211 4,223,819
253 4,223,820

CLASS 226

101 4,223,821
118 4,223,822

CLASS 227

81 4,223,823

CLASS 228

102 4,223,824
114 4,223,825
208 4,223,826

CLASS 229

15 4,223,827

CLASS 232

45 4,223,828

CLASS 233

24 4,223,829

CLASS 235

92 FP 4,224,506
380 4,223,830
412 4,224,507
437 4,224,508
457 4,224,509

CLASS 236

47 4,223,831
49 4,223,832

CLASS 237

51 4,223,833

CLASS 238

10 E 4,223,834
14 4,223,835

CLASS 239

2 S 4,223,836
50 4,223,837
109 4,223,838
177 4,223,839
207 4,223,840
284 A 4,223,841
327 4,223,842
558 4,223,843

CLASS 241

33 4,223,844
34 4,223,845
60 4,223,846
247 4,223,847

CLASS 242

25 A 4,223,848
46.4 4,223,849
66 4,223,850
4,223,851
71.1 4,223,852
107.4 R 4,223,853
204 4,223,855
213 4,223,854

CLASS 244

50 4,223,856

CLASS 246

231 4,223,857

CLASS 248

101 4,223,858
154 4,223,859
171 4,223,860
222.3 4,223,861
4,223,862
246 4,223,863
490 4,223,864

CLASS 249

144 4,223,865
211 4,223,866

CLASS 250

207 4,224,510
213 VT 4,224,511
215 4,224,512
216 4,224,513
231 SE 4,224,514
4,224,515
262 4,224,516
272 4,224,517
305 4,224,518
337 4,224,519
338 4,224,520
340 4,224,521
377 4,224,522
396 R 4,224,523
486 4,224,524
531 4,224,525

CLASS 251

62 4,223,867
326 4,223,868

CLASS 252

8.1 4,224,169
32.7 E 4,224,170
46.7 4,224,171
51.5 R 4,224,172
52 A 4,224,173
62.56 4,224,175
62.9 4,224,174
174.11 4,224,176
301.1 W 4,224,177
313 R 4,224,178
316 4,224,179
392 4,224,180
429 B 4,224,181
4,224,182
4,224,183
4,224,184
4,224,185
429 C 4,224,186
437 4,224,187
455 Z 4,224,188
458 4,224,189
463 4,224,190
4,224,191
466 B 4,224,192
468 4,224,193
476 4,224,194
546 4,224,195

CLASS 254

291 4,223,871
334 4,223,870

CLASS 256

58 4,223,872

CLASS 260

3.5 4,224,196
5 4,224,197
8 4,224,198
4,224,199
18 R 4,224,200
18 TN 4,224,201
22 CB 4,224,202
23 H 4,224,204
23 XA 4,224,203
29.2 E 4,224,207
29.2 N 4,224,206
29.6 B 4,224,205
4,224,208
30.6 R 4,224,209
31.2 R 4,224,211
32.6 N 4,224,210
33.6 R 4,224,212
37 N 4,224,214
37 PC 4,224,215
37 SB 4,224,213
42.18 4,224,216
45.7 PH 4,224,218
45.7 R 4,224,217
112 G 4,224,219
156 4,224,220
202 4,224,221
314.5 4,224,222
340.2 4,224,223
340.5 R 4,224,224
346.71 4,224,225
347.3 4,224,226
347.4 4,224,227
372 4,224,228
397.2 4,224,229
4,224,230
4,224,231
413 4,224,232
448.8 A 4,224,234
449 L 4,224,235
4,224,237
449 R 4,224,236
453 P 4,224,238
501.11 4,224,239
503 4,224,240
543 P 4,224,241
553 A 4,224,242
561 R 4,224,243
562 R 4,224,244
565 4,224,245
570.6 4,224,246
575 4,224,247
580 4,224,248
4,224,249
584 R 4,224,250
4,224,251

CLASS 261

23 R 4,224,257

CLASS 264

0.5 4,224,258
11 4,224,259
4,224,260
15 4,224,261
22 4,224,262
25 4,224,263
54 4,224,264
71 4,224,265
75 4,224,266
111 4,224,267
139 4,224,268
171 4,224,269
4,224,270
184 4,224,271
209 4,224,272
259 4,224,273
333 4,224,274
516 4,224,275
571 4,224,276

CLASS 266

44 4,223,873
129 4,223,874
135 4,223,875
156 4,223,876
262 4,223,877

CLASS 267

34 4,223,878

CLASS 269

32 4,223,879
101 4,223,880
139 4,223,881

CLASS 270

21 4,223,882

CLASS 271

11 4,223,883
21 4,223,884
220 4,223,885
246 4,223,886

CLASS 272

70 4,223,887
103 4,223,888

CLASS 273

127 R 4,223,889
157 R 4,223,890
186 R 4,223,891
237 4,223,893
248 4,223,892
349 4,223,894

CLASS 277

169 4,223,895
207 A 4,223,896
235 B 4,223,897

CLASS 279

1 R 4,223,898

CLASS 280

5 A 4,223,899
11.12 4,223,900
43.12 4,223,901
96 4,223,902
96.1 4,223,903
104 4,223,904
289 R 4,223,905
301 4,223,906
408 4,223,907
419 4,223,908
604 4,223,909
660 4,223,910
731 4,223,911
767 4,223,912
771 4,223,913
803 4,223,914
804 4,223,915
806 4,223,916
4,223,917

CLASS 283

7 4,223,918

CLASS 285

8 4,223,919
24 4,223,920
26 4,223,921
39 4,223,922
95 4,223,923
189 4,223,924
197 4,223,925

CLASS 289

10 4,223,926

CLASS 290

52 4,224,526
54 4,224,527
55 4,224,528

CLASS 292

1 4,223,927
157 4,223,928
169.18 4,223,929
346 4,223,930
347 4,223,931

CLASS 294

1 R 4,223,932
11 4,223,933
15 4,223,934
16 4,223,935
4,223,936
103 R 4,223,937

CLASS 296

21 4,223,938
26 4,223,939
37.12 4,223,940
100 4,223,941
222 4,223,942
224 4,223,943

CLASS 297

148 4,223,944
159 4,223,945
363 4,223,946
367 4,223,947

CLASS 299

4 4,223,948
5 4,223,949
54 4,223,950

CLASS 301

37 PB 4,223,951
63 DS 4,223,952

CLASS 303

2 4,223,953
6 A 4,223,954
22 R 4,223,955
24 C 4,223,956
106 4,223,957

CLASS 307

127 4,224,529
141 4,224,530
221 C 4,224,531
237 4,224,532
247 R 4,224,533
261 4,224,534
270 4,224,535
297 4,224,536
310 4,224,537
317 R 4,224,538
362 4,224,539
400 4,224,540

CLASS 308

9 4,223,958
15 4,223,959

78 4,223,960
174 4,223,961
184 R 4,223,962
188 4,223,963

CLASS 310

45 4,224,541
68 E 4,224,542
71 4,224,543
90 4,224,544
93 4,224,545
178 4,224,546
312 4,224,547
360 4,224,548
4,224,549

CLASS 312

39 4,223,964
100 4,223,965
140 4,223,966
245 4,223,967

CLASS 313

146 4,224,550
323 4,224,551
431 4,224,552
489 4,224,553

CLASS 315

53 4,224,554
151 4,224,555
396 4,224,556

CLASS 318

116 4,224,557
314 4,224,558
601 4,224,559
603 4,224,560
663 4,224,561

CLASS 322

26 4,224,562

CLASS 323

74 4,224,564
225 C 4,224,563

CLASS 324

65 R 4,224,565
71 CP 4,224,567
71 R 4,224,566
78 D 4,224,568
4,224,569
175 4,224,570

CLASS 328

1 4,224,573
38 4,224,574

CLASS 329

50 4,224,575

CLASS 330

4 4,224,576
4.5 4,224,577
138 4,224,578

CLASS 331

94.5 G 4,224,579
116 R 4,224,580

CLASS 333

14 4,224,581
100 4,224,583
116 4,224,584
165 4,224,585
173 4,224,582
192 4,224,586
205 4,224,587

CLASS 335

152 4,224,588
237 4,224,589
306 4,224,590

CLASS 337

102 4,224,591
198 4,224,592
334 4,224,593

CLASS 338

32 R 4,224,594
34 4,224,595

CLASS 339

14 R 4,223,968
15 4,223,969
17 C 4,223,970
95 D 4,223,971
97 R 4,223,972
186 M 4,223,973

CLASS 340

24 4,224,596
58 4,224,597
66 4,224,598
84 4,224,599
146.3 MA 4,224,600
321 4,224,602
347 AD 4,224,605
347 P 4,224,603
4,224,604
514 4,224,606
552 4,224,607
556 4,224,608
576 4,224,609
614 4,224,610
629 4,224,611
647 4,224,612
679 4,224,613
707 4,224,614
712 4,224,615
753 4,224,616
765 4,224,617

CLASS 343

5 EM 4,224,618
4,224,619
4,224,621
5 VQ 4,224,620
7.4 4,224,622
103 4,224,623
112 R 4,224,624
750 4,224,625
911 R 4,224,626

CLASS 346

33 R 4,224,672
75 4,224,627
76 PH 4,224,628
137 4,224,629
150 4,224,601

CLASS 350

1.7 4,223,974
3.68 4,223,975
96.11 4,223,977
96.20 4,223,978
96.21 4,223,976
4,223,979
97 4,223,980
184 4,223,981
216 4,223,982
303 4,223,983

CLASS 351

160 H 4,223,984

CLASS 352

222 4,223,985

CLASS 353

80 4,223,986

CLASS 354

23 D 4,223,987
25 4,223,988
59 4,223,989
204 4,223,990
266 4,223,992
302 4,223,991

CLASS 355

3 R 4,223,993
28 4,223,994

CLASS 356

418 4,223,995

CLASS 357

5 4,224,630
13 4,224,631
17 4,224,632
23 4,224,633
38 4,224,634
41 4,224,635
54 4,224,636
74 4,224,637

CLASS 358

31 4,224,638
158 4,224,639
242 4,224,640
257 4,224,641

CLASS 360

32 4,224,642
70 4,224,643
72.2 4,224,644
73 4,224,645
74.2 4,224,646
96.3 4,224,647
97 4,224,648
128 4,224,649
137 4,224,650

CLASS 361

28 4,224,651
42 4,224,652
144 4,224,653
152 4,224,654
215 4,224,655
433 4,224,656

CLASS 362

67 4,224,657
183 4,224,658

CLASS 363

20 4,224,659
48 4,224,660
71 4,224,661
87 4,224,662
144 4,224,663

CLASS 364

200 4,224,664
4,224,665
4,224,666
4,224,667
4,224,668
433 4,224,669
474 4,224,670
483 4,224,671
501 4,224,673
4,224,674
4,224,675
705 4,224,676
712 4,224,677
715 4,224,678
724 4,224,679
728 4,224,680
738 4,224,681
4,224,682
748 4,224,683
821 4,224,684
900 4,224,685

CLASS 365

154 4,224,686

CLASS 366

27 4,223,996
47 4,223,997

CLASS 367

83 4,224,687

CLASS 368

66 4,223,522
74 4,223,523
84 4,223,526
113 4,223,525
156 4,223,524
204 4,223,521
220 4,223,528
283 4,223,527

CLASS 370

59 4,224,475
62 4,224,688
68 4,224,474
84 4,224,473

CLASS 371

6 4,224,689
25 4,224,690

CLASS 375

28 4,224,571

CLASS 400

126 4,223,998

CLASS 401

176 4,223,999
198 4,224,000

CLASS 403

163 4,224,001

CLASS 404

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D2—	234	256,961		68	256,980		224	256,999		27	257,018	D14—	34	257,037			257,055
		256,962		99	256,981		242	257,000		29	257,019		50	257,038	D22—	1	257,056
	400	256,963			256,982		245	257,001			257,020		84	257,039	D23—	41	257,057
D3—	62	256,964			256,983	D10—	15	257,002		34	257,021		94	257,040		55	257,058
	65	256,965		349	256,984		30	257,003		35	257,022	D15—	66	257,041		122	257,059
	71	256,966		353	256,985			257,004		43	257,023		127	257,042		163	257,060
D6—	22	256,967			256,986		38	257,005			257,024		131	257,043	D24—	5	257,061
		256,968		367	256,987		45	257,006		75	257,025	D16—	54	257,044		53	257,062
	66	256,969			256,988		70	257,007			257,026	D18—	7	257,045		61	257,063
		256,970	D9—	32	256,989		71	257,008		131	257,027	D19—	65	257,046	D25—	38	257,064
	71	256,971		100	256,990		73	257,009	D12—	54	257,028	D20—	41	257,047	D26—	61	257,065
	73	256,972			256,991			257,010		63	257,029	D21—	20	257,048	D27—	51	257,066
	86	256,973		115	256,992			257,011		70	257,030		134	257,049	D28—	13	257,067
	95	256,974		147	256,993			257,012		153	257,031		214	257,050	D30—	16	257,068
	113	256,975		185	256,994		78	257,013		205	257,032		227	257,051	D99—	27	257,069
	140	256,976		186	256,995			257,014		210	257,033		229	257,052		34	257,070
	161	256,977		189	256,996	D11—	4	257,015	D13—	24	257,034		243	257,053		37	257,071
D7—	123	256,978			256,997		16	257,016		28	257,035						

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DESIGN PATENTS

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17 : 257,013
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27 : 256,975
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36 : 256,977
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40 : 257,056
42 : 257,069
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48 : 256,974
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